Liberty Paint
Liberty 32/64
Artist's Manual

An Infinite Freedom Component

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1 - Introduction

1.1 INTRODUCTION

The Liberty software package is designed to be used by artists with no specialized computer or computer graphics experience. The basic functions are simple and straightforward. This manual is intended to provide, first, information for the basic use of the Liberty software, and, second, the explanation of the more complicated variations on the basic functions. Some functions, such as certain uses of the Diagram Popup to modify Masks or the use of the scientific calculator, can become complicated, but the user must seek out such complexity.

1.1.1 About this Manual

Use this manual to learn the operation of the Liberty software by starting at the beginning and going through it step-by-step. After you have some experience with Liberty, use the manual as a reference book to get more details about functions. For your convenience, this manual is divided into sections as follows:

- **Table of Contents/List of Figures**
- **This Introduction**
- **Section 2: Login Environment**
- **Section 3: Configuration Environment**
- **Section 4: Paint Environment**
- **Section 5: Animation Environment**
- **Index**

1.1.2 Hardware Platform

Liberty software runs on a number of SGI hardware platforms. For hardware startup and shutdown routines please consult the documentation for the particular hardware platform that your copy of Liberty is running on.

NOTE

Installation of Liberty software and a digitizing tablet is covered in the appropriate Liberty Technical Reference document and is not covered in this manual.

1.1.3 Custom Menu Colors

Liberty allows you to customize the colors of your menus. In this manual all references to the color of menu buttons refer to the standard default menu colors.

1.2 A NOTE ON LIBERTY ENVIRONMENTS

The full Liberty software package consists of four **Environments** in which you do your work: The **Login** Environment, The **Paint** Environment, The **Animation** Environment, and the **Configure** Environment. If you have Liberty Paint software, the Animation Environment is not activated.

1.3 NAVIGATING THE ENVIRONMENTS

1.3.1 Arrangement of Functions

In the Paint and Animation Environments, Liberty provides a **Canvas**, or picture screen, for the creation and display of pictures. In the Paint Environment, areas of the Canvas can be masked for operations. These areas are **Masks**.

Temps are additional frame buffers, or picture storage areas, where you store pictures for quick recall during active work on a project.

Menus are all the buttons, slider scales, and displays which you will use to operate on the Canvas.

The **Prompt Window** is a wide, narrow window at the bottom of the screen that displays help information about functions you are using.

Elevators are a series of storage registers found in various menus that allow you to quick-store a number of temps, masks, and other elements, rather than having to save them on disk. They are represented by a series of small boxes grouped in a horizontal or vertical line (6, 8, or 10 boxes).

1.3.2 Menu Buttons and the Tablet

All menu buttons are activated by pressing the pen down on the tablet (you can configure Liberty for the mouse if no tablet is installed: see the Liberty Technical Reference Manual). No button requires the use of the Shift, Control, or Alt keys to modify its behavior. If a button is disabled, then the text on the button fades slightly. In this way you can see at

a glance which buttons are or are not enabled for use. You can assign menu buttons to keys on the keyboard, as well as entire macros. *(Refer to "Pre-Defined Macro Functions" on page 4-419 for a listing of pre-defined keys.)*

1.3.3 Slider Scales

Many functions in Liberty are controlled by slider scales. Pressing down on the scale and dragging the slider changes the value of the slider scale and thus changes the function controlled by that slider scale. Pressing the arrow button at either end of a slider scale causes the slider scale to increment or decrement one unit. Whenever you change a slider scale value, its name is displayed in the Prompt Window at the bottom of the screen. Directly underneath or above each slider scale is a number window that displays the value of that slider. Pressing on the number window enables you to type in a new value from the keyboard and change the slider in that way. Typing "p" (plus) before a number adds the number to the value; typing "m" (minus) before a number subtracts that number from the value. For example, if the value is 7 and you type "m2" the new value will be 5.

NOTE

You must press Enter after any Keyboard input.

When you press on a menu button that takes numerical input, such as the Direction Button, it shows its name and current numerical value in the Prompt Window. Typing a number on the keyboard, followed by **Enter**, changes the current value. Typing "p" (plus) before a number adds the number to the

value; typing "m" (minus) before a number subtracts that number from the value, just the same as with number windows.

1.3.4 Calculator

Pressing in the input area on the right end of the Prompt Window calls up the calculator with the input value showing in the calculator display. The calculator is used for more complicated calculations. Pressing the OFF button on the calculator causes it to disappear.

1.3.5 Number Windows/Text Windows

There are other number windows in Liberty besides the ones underneath the slider scales (especially in the Animation Environment). Pressing on a number window enables you to type in a new value, and you can use "p" and "m" the same way you would with a slider scale.

Text windows are the same as number windows, but you type text into them (usually one or two words). These are almost exclusively found in the optional Animation Environment.

1.3.6 Keyboard

While using Liberty, artists can create images, and adjust the great variety of parameters, using the system's mouse and/or tablet pen as well as slider and diagram controls found in various menu pop-ups. The SGI keyboard is used to input specific numeric values, text editing, binding menu functions (and

macros) to keys, and adjustment of paste positioning. All text and numeric input from the keyboard must end with the **Enter** key.

1.3.7 Help!

Liberty provides a green Help Button at the upper left corner of the Paint Environment near the brush Display. In the Animation and Configure Environments, the green Help Button is at the lower right corner of the screen. Press the Help Button, then press the button that you need help with. The name of the pressed button and a short description appears in the Prompt Window.

2.1 THE LOGIN ENVIRONMENT

Liberty automatically logs on as “art,” but you can create 99 user-defined login accounts in Liberty. To login using a different account, press on the name or number of the account you want to use. If prompted, type the appropriate password.

Once you are logged in to the account of your choice, you can press on one of the environment buttons at the bottom of the screen. To exit Liberty, press the Exit button.

User Login Accounts

When you logout of a Login Account, many of the settings in Liberty are remembered and will be re-set for you when you log back into the same account at a later time. To create a User Login Account, refer to the Configure Environment description.

A Note for Beginners

In this manual the Configuration Environment is discussed next. You'll use the Configuration Environment to customize your menus, set your resolution, set up your VTRs, and do many other functions. However, the default settings are usually adequate and you can proceed directly to the Paint or Animation Environment. If you're just beginning to learn the Liberty software, start by going to the Paint Environment.

Figure 2-1. The Login Environment

3 - Configuration Environment

3.1 Configuration Environment

Use the Configuration Environment (Figure 3-1) to configure Liberty's variable settings. Many of the configurations are stored when you exit Liberty and are automatically reset when you login again to the same User Login Account.

3.1.1 Configuration Environment Functions

The functions of the Configuration Environment include:

- **Customizing menu colors.**
- **Configuring screen resolution and animation frame-rate.**
- **Setting Fast (RAM) Temporary Picture and Mask Buffers.**
- **Creating, renaming, and deleting directories.**
- **Configuring video recording devices.**
- **Adding or deleting user accounts from the login list.**
- **Installing software options.**
- **Displaying information about your version of Liberty.**
- **Choosing a cursor style.**
- **Modifying settings for the pen and tablet.**

The top part of the Configuration Environment consists of the **color palette**, for customizing the colors of the menu. The bottom two-thirds of the screen contains **four panel menus** which can be replaced by other panel menus as needed.

At the bottom of the screen is a horizontal row of ten buttons called the **panel call buttons.** Press one of these buttons and then press anywhere in a current panel menu to replace it with the new one. From left to right, the Panel Call Buttons of the Configuration Environment call up:

- **The User Management Panel**
- **The Canvas Configuration Panel**
- **The Menu Configuration Panel**
- **The Directory Configuration Panel**
- **The Video Configuration Panel**
- **The Video Framer Panel**
- **The Undo Panel**
- **The Option Management Panel**
- **The Cursor Configuration Panel**
- **The Tablet Configuration Panel**

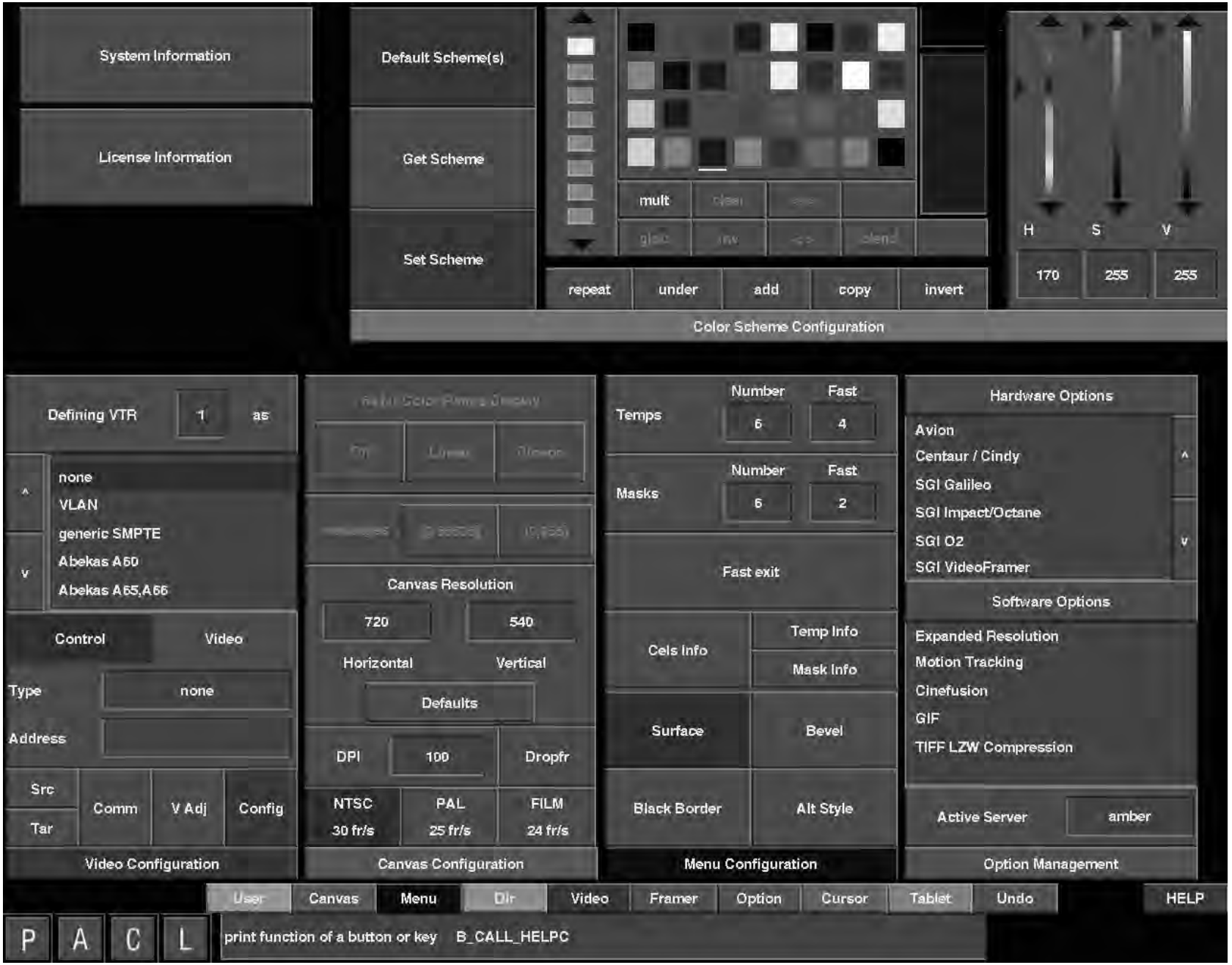

Figure 3-1. Configuration Environment

3.1.2 Customizing Menus

In the Configuration Environment, you can change the colors of the menu to fit your personal preferences. Liberty remembers these settings in your login account, and they will be the same the next time you login to the same account.

The default menu settings are optimized for general use. Get acquainted with the use of the Liberty software before deciding on your personal menu color configurations.

3.1.3 Color Scheme Palette

This palette (***Figure 3-2***) is the same as the standard palette in the Paint Environment, except that when you press on a color to choose it, the name of its menu parameter appears in the Prompt Window, rather than its Red, Green, Blue, and Transparency values.

The menu color controlled by each box is shown on ***page 3-7***.

Menu Color Scheme Palette Elevator

You can store eight different palettes in the Menu Colors Palette Elevator at the left of the main palette. There are several default color schemes stored in the levels of the elevator. Use the Default scheme button (described in section 3.1.4) to change the menus to the default color scheme for the current elevator level. Use the Get scheme button (also in section 3.1.4) to put the default scheme's colors into the current palette elevator level.

Pressing on an elevator box displays its palette. This elevator works identically to the Color Palette Elevator in the Paint Environment. You can copy the top elevator level into other levels and save seven alternate color schemes in one login account.

3.1.4 Changing the Colors of the Menu

To change a menu color, press on the corresponding palette box. It is underlined and the name of the menu parameter appears in the Prompt Window. Change the color with the slider scales at the right. Repeat for as many menu parameters as you like; then press the **Set Scheme Button**. The menu changes to the new colors. The menus of other environments will also be changed when you go to them.

Default Scheme(s) Button

Press to restore the default standard menu colors. This does not change the Menu Configuration Palette, only the menu colors. There is several default color schemes that you can choose between stored in the palette elevator (see below).

Table 3-1: Palette Customizing Buttons

Top Row	"Desk" Background	Button Surface	Inset Button Surface	Popup Menu Surface	Text	Activated Button	Mode Button	Active Elevator Box
Second Row	Inactive Elevator Box	Up/Down Slider Arrows	Slider Pointer	Top/Bottom Slider Pointers	Marker Bars in Sliders	Moving Slider	Underlined Palette Pot	Keyboard Input Highlight
Third Row	Edited Diagram Curve	Final Diagram Curve	Light Button Bevel (alt)	Dark Button Bevel (alt)	Animation Timeline Raster	Underlined Palette Hot Color	Wireframes	Handles on Wirefames
Fourth Row	Grids, Shapes & Field Guides	Bad or broken Wireframes	Multi-points on corner inbetweening	Extra wireframe color	Extra wireframe color	Canvas scratch space	Dimmed Text Color	Unassigned

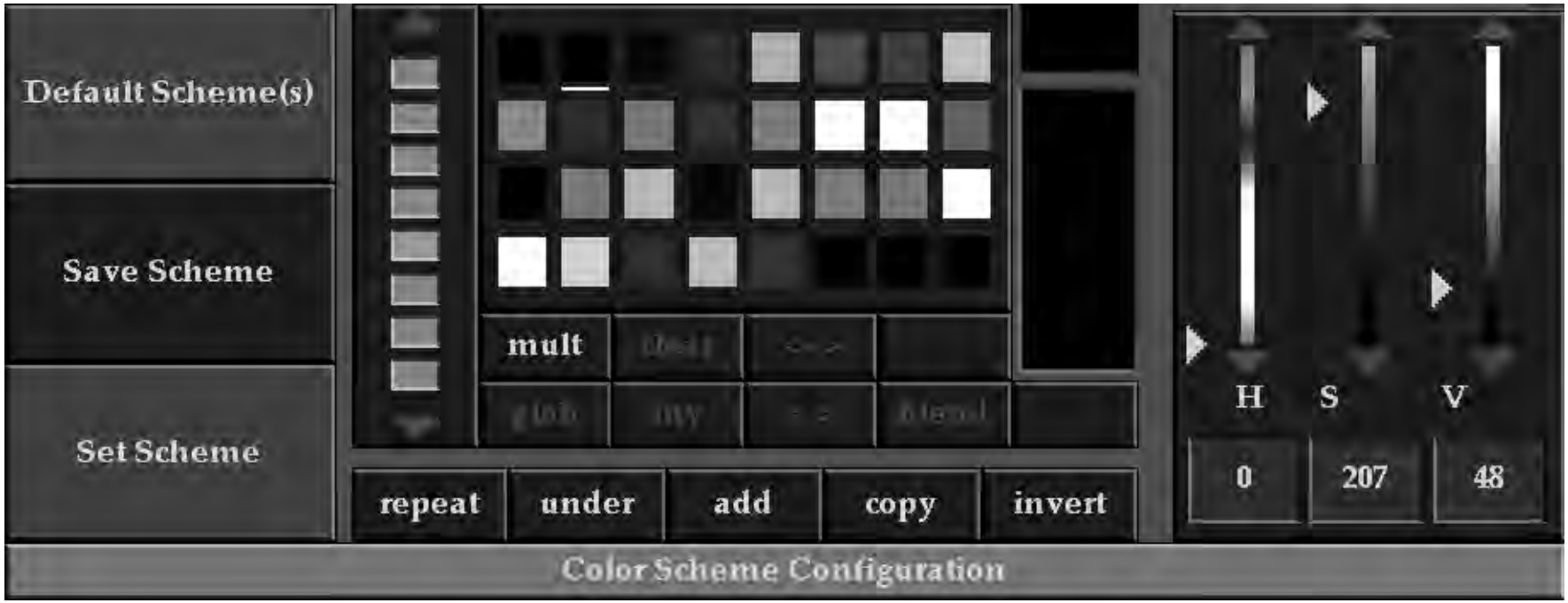

Figure 3-2. Color Scheme Palette

Get Scheme Button

Press to copy the current menu colors to the palette. When you are changing the colors on the palette, use to restore the palette back to the current menu colors.

Set Scheme Button

Press to display the Menu Configuration Palette colors in the menu.

3.1.5 System Info Button

Press this button to call up the System Info Popup, which displays information about the current version of Liberty software you are running, as well as information about your hardware platform. It lists the following:

- **Current Liberty version number**
- **Date compiled**
- **Current date and time**
- **Host name**
- **Internet ID setting**
- **Physical RAM**
- **User RAM**
- **Free RAM**
- **Free virtual memory**
- **Size of Liberty software**
- **Free SYS disk space (%)**

Press the OK Button to close the popup.

3.1.6 License Info Button

Press this button to display the License Information Popup, which displays information about what Liberty software options are currently enabled. It lists each Liberty software option, its version number, and whether it is enabled (available) or not.

Press the OK Button to close the popup.

3.2 USER PANEL

Figure 3-3. User Panel

Use these functions to add or delete User Login Accounts from the Login Environment.

User Login Accounts

You create a User Login Account to remember various Liberty settings. If several artists use the same Liberty installation, each artist might have a User Login Account. Different projects might each have its own User Login Account. You might create a User Login Account for each different screen resolution you commonly use. The User Login Accounts are displayed in a list in the Login Environment. Liberty can have up to 99 different User Login Accounts.

Add User Button

The Add User Button allows you to create a new User Login Account. A new User Login Account will contain Liberty's current settings. Once you have created a new User Login Account, you can login to the new account and customize the settings (such as resolution, menu colors, etc.) that you want to be part of the new User Login Account.

To add a new User Login Account:

[ ] 1. **Press the Add User Button.** The User Popup appears. It should show the lowest-numbered unused login entry.

[ ] 2. **Press in the User Name Text Window, and type in the User Login Account Name.** It must be less than 20 characters. Avoid spaces and punctuation marks.

[ ] 3. **Press Enter.** The cursor moves down into the User Password Text Window.

[ ] 4. **Type in the User Login Password.** If you do not want a password, skip to step 5.

[ ] 5. **Press Enter.** If you want to create another User Login Account, press the Next button, and go back to step 2.

[ ] 6. **Press the OK Button** to confirm the new User Login Account(s) you've created. The User Login Popup disappears. To exit the popup and cancel all changes, press the Cancel Button.

NOTE

After adding a user's name you cannot edit it; instead, delete it and re-add, if necessary.

Delete User Button

The Delete User Button allows you to remove an existing User Login Account. When a User Login Account has been deleted, its name disappears from the list of User Login Accounts in the Login Environment, leaving an empty space for that number. You can then add a new User Login Account where the deleted account was.

To delete a User Login Account:

[ ] 1. **Press the Delete User Button.** The User Popup appears.

[ ] 2. **Press on the Next and Previous Buttons to cycle through the existing Login Accounts.** Find the one you want to delete.

[ ] 3. **Press the OK Button.** The User Login Account is deleted, and the User Login Popup disappears. To exit without deleting an account, press the Cancel Button.

Set User Password Button

The Set User Password Button allows you to create a password for a User Login Account that doesn't have one, or to change an existing password.

To change a User Login Account Password:

[ ] 1. **Press the Set User Password Button.** The User Popup appears.

[ ] 2. **Press on the Next and Previous Buttons to cycle through the existing Login Accounts.** Find the one for which you want to create a password or whose password you want to change.

[ ] 3. **Press on the User Password Text Window.**

[ ] 4. **Type in the new password and press Enter.** If you want to change another password, go back to step 2.

[ ] 5. **Press OK to confirm the new password(s).** The User Login Popup disappears. To exit the popup without making any changes, press the Cancel Button.

Set Administration Password Button

Figure 3-1. Administration Password Popup

The Set Administration Password Button allows you to create a password for access to the Configuration Environment.

To change an Administration Password:

- **Press the Set Administration Password Button.** The Administration Password Popup appears.
- Type a password into the Password Field. (The characters, when typed, appear as asterisks for security reasons.)
- Press OK.

After exiting the Configuration Environment, any attempt to re-enter Configuration from another environment requires the password.

Delete Button

The Delete button will delete the password from the system so that it is not activated when entering the Configuration Environment.

3.2.1 User Popup

Press any of the top three buttons in the User Panel to call up this popup menu.

User Number Text Window

Press to enter a User Login Account number, 1 through 99. The default is the lowest unused number.

User Name Text Window

Press to enter the User Login Account name, up to 20 characters.

User Password Text Window

Press to enter the User Login Account password, if any, up to 20 characters.

Next Button

Press to display the name of the next User Login Account.

Prev Button

Press to display the name of the previous User Login Account.

Cancel Button

Press to cancel any changes you made to the User Login Accounts and exit the User Popup.

OK Button

Press to confirm any changes you made and exit the User Popup.

3.3 CANVAS PANEL

Figure 3-4. The Canvas Panel

64-bit Color Range Display (Liberty 64 Only)

When using Liberty 64, the monitor of your computer can't display the full range of colors in the 64-bit canvas. To display the canvas image, Liberty normally does a linear conversion to display the 64-bit colors on the screen. The 64-bit Color Range Display functions allow this conversion to be altered. The following options exist:

Off

When this button is on, Liberty does a linear conversion to display the 64-bit canvas colors on the screen. In other words, the software does not perform any contrast adjustments or other color corrections when displaying the canvas on the screen. The lower bits of each pixel are merely discarded to convert the pixel from 64-bit to 32-bit for screen display. This is the default mode.

Linear

This allows the user to turn on a linear contrast correction, so that canvas pixels are contrast corrected before being displayed on the screen. Pressing on the Linear button brings up a slider with two markers (shown below). The upper marker represents the white point. Lowering this marker brightens the bright colors of the canvas when displayed on the screen. The lower marker represents a black point. Increasing this marker darkens the dark colors of the canvas when displayed on the screen. The Reset button resets the markers to the bottom and top of the slider, which essentially turns the contrast correction off.

Note that this function only affects the range of colors displayed on the screen. The actual contents of the canvas image is not modified.

Figure 3-5. Linear Contrast Slider

Cineon

This function, when enabled, performs a log to linear conversion when the 64-bit canvas colors are displayed on the screen. This function is normally used when using images read from Cineon (or DPX) files, which are often in log format. Pressing on the Cineon button brings up a popup menu with five sliders, a Convert Off button, and a Reset button (refer to the figure shown below). The sliders represent black points for Red, Green, and Blue, an overall white point, and a gamma value. Increasing the black points makes the dark colors darker, while decreasing the white point makes the bright colors brighter. The gamma slider adjusts the middle ranges in the image. The Reset button sets the menu to the default log to linear conversion values for Cineon files, and will almost always be used when

this function is on. The Convert Off button sets the values so that no conversion is done (black points at 0, white point at 1023, and gamma at 1.0). This is equivalent to turning the function off.

Once the settings in the popup are complete, the OK button brings down the popup and makes the settings active.

Note that this function only affects the range of colors displayed on the screen. The actual contents of the canvas image is not modified.

This function is utilized in conjunction with the Cineon and DPX set-up controls in the Save As popup in the Paint environment (see ***page 4-198***). There are two modes of working with log Cineon or DPX files:

Log: The user works with log data within Liberty. In other words, Cineon files are NOT converted to linear format when read into Liberty (likewise, images are NOT converted back to log format when saved from Liberty, since they already are in log format). The user works in log format, but turns on Cineon log to linear conversion for display of the image on the screen. This way, the canvas looks good when displayed on the screen, but the pixels are kept in log format internally, preventing any conversion artifacts from being introduced.

To run in this mode, the user would set the Cineon and DPX set-up controls in the Save As popup in the Paint environment (see ***page 4-198***) to "Convert Off", turning off conversion when the files are saved and recalled. They would also turn on log to linear conversion for screen display of the image, by using the Cineon function described above. They would

enable this function by pressing on the Cineon button in the 64-bit Color Range Display section of the Canvas Configuration panel to bring up the Cineon popup, and pressing the reset button in the popup to activate the default conversion values. The sliders in the popup could also be fine tuned as needed.

Linear: The user works with linear data within Liberty. In other words, Cineon files ARE converted to linear format when read into Liberty (and back to log format when saved back out). The user works in linear format, and turns off Cineon log to linear conversion for display of the image on the screen (since the images are already in linear format within Liberty). This mode is preferable for some imaging functions in Liberty (such as Chroma keying), as these functions work better when using linear image data.

To run in this mode, the user would set the Cineon and DPX set-up controls in the Save As popup in the Paint environment (see ***page 4-198***) to do conversion, by pressing the red Reset button in the Cineon or DPX set-up menu, and fine tuning the sliders if needed. This turns on conversion when the files are

saved and recalled. They would also turn off log to linear conversion for screen display of the image, by selecting the "Off" button described above for 64-bit color range display (in the Canvas Configuration panel).

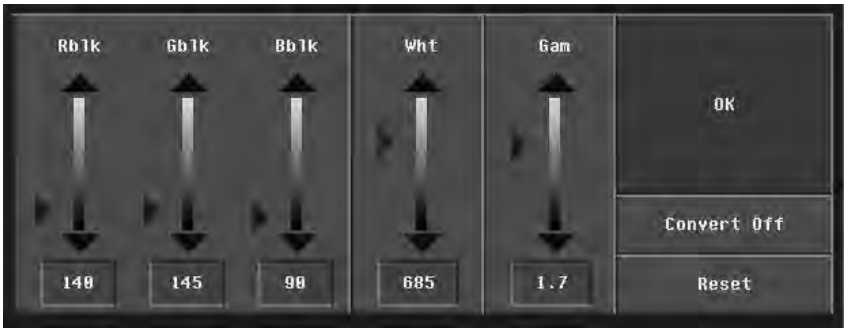

Figure 3-6. Cineon Setup Control

Messages Functions (Liberty 64)

When using Liberty 64, there are two Modes available in the Messages Buttons: 0 to 65535 and 0 to 255. Press on one of them to activate it. When you are in 65535 Mode, all colors in Liberty are displayed in a range of 0 to 65535. If you want to display these same colors, but using the more familiar 0 to 255 range, press on the 0 to 255 Button. Again, these settings will have no effect on the picture itself, but only on the numbers used to manipulate the colors.

Resolution Functions

Liberty is capable of resolutions of up to 8000 pixels by 8000 lines. The resolution you can actually use depends on which Liberty software package you are using and on how much RAM (Random Access Memory) your hardware configuration has. If you try to enter a resolution that is too high for the

amount RAM your system has, Liberty displays a warning. You can bypass the warning and continue to operate Liberty, but performance may be more or less slowed down.

Liberty 32 and Liberty Paint are limited to 1000 pixels by 1000 lines. The optional Expanded Resolution Option offers 8000 pixels by 8000 lines of image resolution. *Liberty 64 is fully capable of up to 8000 pixels by 8000 lines.*

Horizontal Resolution Button

Press to enter a new horiz. resolution (16 to 8000).

Vertical Resolution Button

Press to enter a new vertical resolution (16 to 8000).

Defaults Resolution Button

Press the Defaults button to call up the Defaults Resolution Popup (**page 3-25**) which has preset resolutions.

Each button represents a preset resolution. If you are working in video, choose a video resolution by pressing the appropriate button; then press OK. In video when transferring the image from the Canvas to the video board, you can choose to have no change in pixels (1:1 Pixel Aspect) or to maintain the 3:4 video aspect ratio (4:3 Pixel Aspect) so that circles stay circular instead of becoming flattened. If you are working in film, choose the appropriate film resolution (Full, Half, and Quarter) while maintaining the correct film aspect ratio.

The Interpolate Button determines whether the image is filtered or not when it is transferred from the Canvas to/from the video board. Interpolate On causes the image to be filtered when it is resized

from the Canvas to the video board (in video 1:1 there is no re-sizing, so interpolation is not needed). Interpolation On may make the image slightly softer. When Interpolate is Off, the image is not filtered. No interpolation results in some aliasing.

NOTE

It is usually important to configure the Canvas resolution to match your image resolution when recalling large files from disk. Images are recalled to the canvas beginning in the lower left corner. An image file that is larger than the canvas will be truncated and the extra image data not recalled. If the image is saved again, only the picture information on the active canvas will be saved, and the rest of the data from the large image will be lost.

To remove the Default Resolution Popup without choosing a new resolution, press OK.

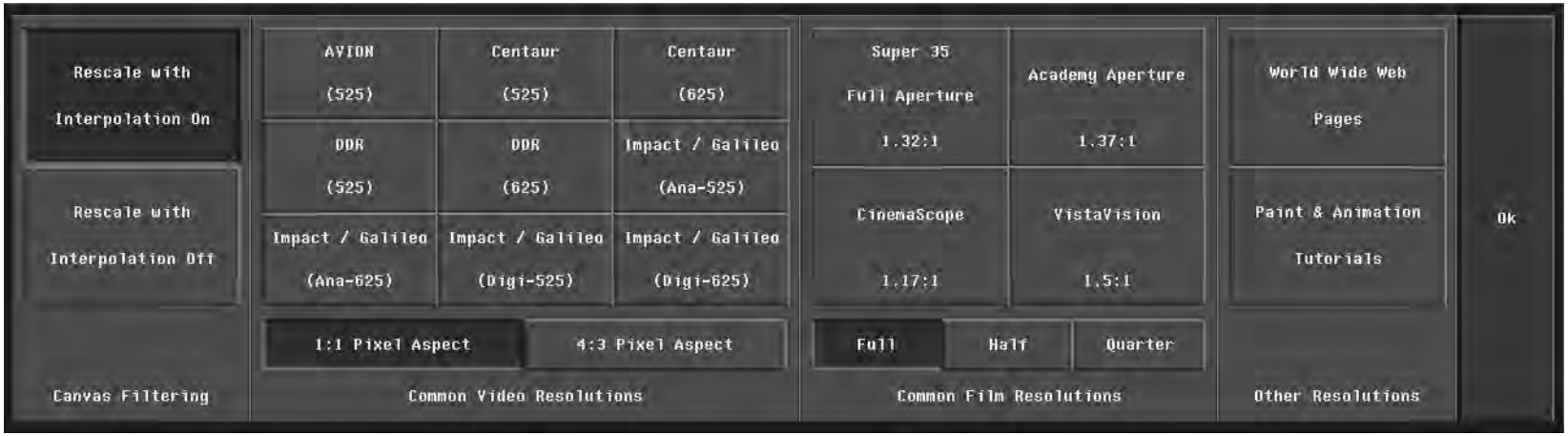

Figure 3-7. Defaults Resolution Popup

Dots Per Inch Button (DPI)

Press to reset the Dots-Per-Inch setting. Liberty uses this setting for Paint functions, such as Grid and Pick Color to measure distances on the screen for pre-press applications. 100 is the default for SGI monitors.

Dropframe Button

Press to turn on and enable video recording in Drop-frame Mode.

Frame-rate Buttons

Press on one of the three Frame-rate Buttons to set the frame-rate to 30 frames per second (NTSC), 25 frames per second (PAL), or 24 frames per second (film). When on, the chosen button is high-lighted blue.

3.4 MENU PANEL

Figure 3-8. Menu Panel

This panel allows you to configure how many of Liberty's temporary picture buffers (temps) and mask buffers you want to have and how many are saved in RAM instead of on disk. You can also configure Liberty for fast exits, and customize the look of your menu buttons.

Temp Number Button

Liberty's Paint Environment provides by default six temporary work pages, or picture storage buffers, called temps. You can configure as many temps as you want by pressing in the Temp Number Button and entering the number of temps you want. When you go back to the Paint or Animation Environment you'll be prompted for a re-start of Liberty before the new temps are configured.

Fast Temps Button

Depending on the amount of RAM (Random Access Memory) on your system, you can assign some or all of the temps to RAM for fast access. The other temps are stored on disk and are accessed more slowly. The minimum (and default) number of fast temps is 1, the maximum depends on how much RAM you have and how big your temps are. Only Fast Temps can be used as Layers in the Paint Environment.

Press inside the Fast Temps Button to type the number of fast temps.

When you go back to the Paint or Animation Environment you'll be prompted for a re-start of Liberty before the new fast Temps are configured.

Mask Number Button

Liberty's Paint Environment provides by default six mask buffers. You can configure as many masks as you want by pressing in the Mask Number Button and entering the number of masks you want. When you go back to the Paint Environment you'll be prompted for a re-start of Liberty before the new masks are configured.

Fast Masks Button

Depending on the amount of RAM on your system, you can assign some or all of the masks to RAM for fast access. The minimum number of fast masks is 1, the maximum depends on how much RAM you have, how many fast temps you've configured, etc.

Press inside the Fast Masks Button to type the number of fast masks.

When you go back to the Paint or Animation Environment you'll be prompted for a re-start of Liberty before the new fast masks are configured.

Fast Exit Button

Press this button to turn on Fast Exit Mode. When on, Fast Exit Mode causes fast temps (RAM Temps) and fast masks NOT to be saved when you exit Liberty. This speeds up the process when you exit Liberty.

The Fast Exit button is off by default, so fast temps and fast masks are saved when you exit Liberty. Note however that this is not permanent storage; the next use of the fast temps overwrites the saved temps.

Info Buttons

These buttons provide information about Liberty's various buffers.

Cels Info

Press the Cels Info Button for a text list containing data about the various image buffers in Liberty (including the Canvas, each RAM temp, and each RAM mask). For each image buffer, the following information is provided:

Name of the image buffer (for example "Temp 4"). For temps and masks, a small arrow (>) next to the name indicates that this is the current temp or mask.

(x, y) For layers, this shows the current x and y position of the layer.

(xs, ys) The total x and y size in pixels of the buffer (for layers, this is the size of the image the layer contains; for the canvas and masks, it is the canvas resolution).

Size The size in bytes of the image buffer.

Bound For the Canvas and masks, this shows lower left (x,y) position and size in pixels (xs,ys) of the image in the buffer. This is useful since the Canvas and masks are NOT sized to the image they contain, and this tells where the image is in the buffer (assuming the image is a cutout). For layers, you can ignore this section (since layers are always sized to the cutout they contain).

Temp Info and Mask Info

The Temp Info Button is similar to the Cels Info Button, except that it only provides information on the temp buffers (layers). Likewise, the Mask Info Button only provides information on the mask buffers. These menus may be useful when there are too many temps and masks to fit on the Cels Info menu (which is not scrollable).

Button Configuration Buttons

Button, button, who's got the button? Here, you can set the visual style for all the buttons in Liberty's menus. Please note that the Surface and Bevel buttons are mutually exclusive; turning on one turns the other off.

The Surface Button

Press the Surface button to turn Surface Mode on/off. When Surface Mode is on, Liberty displays turned-on buttons by highlighting the surface of the button.

The Bevel Button

Press the Bevel button to turn Bevel Mode on/off. When Bevel Mode is on, Liberty displays turned-on menu buttons with colored bevels that push IN (become debossed). In Alt mode (see below) you can set the highlight color and the bevel colors in the menu configuration palette.

The Black Border Button

Press the Black Border button to turn Black Border Mode on/off.

When the Black Border Mode is on, Liberty draws thin black borders around all menu buttons. This makes buttons look sharper and crisper on a high-res screen.

The Alt Style Button

Press the Alt Style Button to turn Alternate Style Mode on/off. When the Alt Style Mode is on, Liberty sets beveling colors to be user-defined (in palette row 3, columns 3 and 4) instead of system-defined.

3.5 DIRECTORY PANEL

Figure 3-9. The Directory Panel

Liberty provides for the creation, naming, re-naming, and deleting of directories on the hard disk(s). Use directories to organize your work in ways that make sense to you. Keep in mind that others may need to access your directories, so simple, common-sense naming conventions may be in order. A directory name like **"PCD421aFINAL2"** may be too obscure at a later time, no matter how logical it seems now.

NOTE

Avoid punctuation marks and spaces in directory names (This is also true for filenames of any type).

Create Directory Button

Press to create a new directory. The file popup appears with the directory line high-lighted.

Type in the desired directory name and hit Enter. When you go back to the Paint or Animation Environment you can save files into the new directory.

Delete Directory Button

Press to delete an existing, empty directory. The file popup appears with the directory line high-lighted.

Type in the name of the directory you want to delete and press Enter, or you can press on the directory name in the file list. The indicated directory is deleted, if it is empty. If the directory has any files in it, a message appears: "Sorry, no permission." In this case, go back into the Paint Environment and delete all the files in the directory before trying to delete the directory.

Rename Directory Button

Press to rename a directory. The file popup appears with the directory line high-lighted.

Type in the name of the directory to be renamed and press Enter, or press on the directory name in the file list. Type the new name for the directory and press Enter. The directory is re-named.

User Setup Button

Liberty has a file in its home directory (for example, **/usr/people/liberty**) that maintains the path to certain directories constantly being accessed by the program. These directories are:

Cels	The disk copies of the canvas, temp buffers, and mask buffers are located here.
Image	Images, animations, and other files created by the user are located here.
Plug-ins	Plug-in filters are stored here.
Project	Liberty saves the state of its menus and elevators here.
Undo	Files for Undo are saved here.

The file **liberty_paths** is a text file that tells Liberty the location of these files. This file is a text file that can be edited by a number of text editors to make changes (e.g. JOT). By editing this file, the user can change the locations of these directories. For example, the user could create a directory on an external hard drive to store images, then change the path for the Image directory in the **liberty_paths** file to match this new location. This would tell Liberty to always look for images on the external hard drive.

However, instead of using a text editor, Liberty provides a menu pop-up for editing the paths to the directories. By selecting the User Setup button, a pop-up menu appears with file windows for Cels, Image, Plug-ins, Projects, and Undo plus the OK and Cancel buttons. Clicking in one of the five windows brings up the File Recall Popup, allowing the

user to select a new directory path. Liberty then automatically updates the **liberty_paths** file with the new path information.

Re-label ImageStor! Button

This button allows you to re-label fields in the ImageStor! Pop-up.

3.6 VIDEO PANEL

Figure 3-10. The Video Panel

Use the Video Configuration Panel to define as many as six physical video recorders (or digital disk recorders), depending on how many ports your hardware supports. When you are in the Paint or Animation Environments, you can use the VTR Menu there to set up any defined recording device as Source or Target, or both simultaneously. You can then control the recording device(s) directly from the Liberty menu for playback, cueing, shuttle, etc.

Video Recording and Video Boards

To record video from Liberty you must have a video board installed (or have a digital disk recorder [DDR]) to convert the RGB output of Liberty to a video format. Liberty includes software for use of various video boards and DDRs that are available for different models of SGI platforms. Consult your Chyron or SGI salesperson if you need information about video board/DDR options for your Liberty workstation.

3.7 CONFIGURING VTRS

To be able to control a recording device (other than a DDR) from Liberty, install the option for the video board you are using. (Centaur, Video Framer, etc.) *See* ***page 3-47*** *for more information.*

CAUTION

You must have only one video board option installed at any time, or VTR control will not work.

Configure your video board option. See the configuration instruction document of the video board you have installed.

The buttons on the VTR configuration panel configure Liberty to match your recording device.

Define VTR Button (Defining VTR As:)

Pressing on the number window *(at the top of the Video panel, labeled "Defining VTR as")* cycles through the video recorders. The number displayed is the number of the video recorder you are defining. Cycles from 1 to 6.

Model List

The Model List is the list of models of video recorders that Liberty controls directly and currently supports. The model list is the list of devices just below the "Defining VTR as" button in the Video panel. Any models not on this list are controlled by a VLAN device, which is one of the choices in the list.

For instance, you could define VTR 1 as VLAN and VTR 2 as Abekas A60. VTR 3, 4, 5, and 6 could be defined as "none." Any unused VTR numbers (1 through 6) should be set to "none," because logging in will be faster if Liberty doesn't have to take time to configure VTRs unnecessarily.

Scroll through the list until you see the model you want to define; then press it.

^ (up) scrolls the model list up.

v (down) scrolls the model list down.

The Model List includes the following choices:

- **none**
- **VLAN**
- **generic SMPTE**
- **Abekas A60**
- **Abekas A65, A66**
- **Abekas Diskus**
- **AMT 7422**
- **Accom RTD 4224**
- **Accom WSD**
- **RCI**
- **SDL QuickFrame/Diskcovery**
- **MMS ProntoVideo**
- **RCI**

Control Button

Press the Control Button to set up the communication path for transmission of control data to the video device. When pressed, the Control button will highlight. Use the Type window and Address window to configure the control path. (Refer to ***Table 3-2*** for correct device control types).

Table 3-2: Device Control Type/Address Listing

Device	Control		Video	
	Type	Address	Type	Address
VLAN	Serial A/1, Serial B/2	Address	AVION, Centaur, Galileo, Framer, VideoLab	
generic SMPTE	Serial A/1, Serial B/2	Address	AVION, Centaur, Galileo, Framer, VideoLab	
Abekas A60	Serial A/1, Serial B/2	Address		
	Ethernet	hostname	Ethernet	hostname
Abekas A65, A66	Serial A/1, Serial B/2	Address		
	Ethernet	hostname	Ethernet	hostname
Abekas Diskus	Serial A/1, Serial B/2	Address		
	Ethernet	hostname	Ethernet	hostname
			SCSI	SCSI dev
AMT 7422	Serial A/1, Serial B/2	Address	AVION, Centaur, Galileo, Framer, VideoLab	
Accom RTD 4224	Ethernet	hostname	Ethernet	hostname
			AVION, Centaur, Galileo, Framer, VideoLab	
Accom WSD	Ethernet	hostname	Ethernet	hostname
	SCSI	SCSI dev	SCSI	SCSI dev
			AVION, Centaur, Galileo, Framer, VideoLab	
RCI	Ethernet	hostname	Ethernet	hostname
			AVION, Centaur, Galileo, Framer VideoLab	
SDL QuickFrame/Diskcovery	Ethernet	hostname	Ethernet	hostname
	SCSI	SCSI dev	SCSI	SCSI dev
			AVION, Centaur, Galileo, Framer, VideoLab	
MMS ProntoVideo	Ethernet	hostname	Ethernet	hostname
	SCSI	SCSI dev	SCSI	SCSI dev
			AVION, Centaur, Galileo, Framer, VideoLab	

Video Button

Press the Video Button to set the video path for the video device. When selected, the Video button will highlight. Use the Type window and Address window to configure the video path.

Type Window

The type window is used to set the type of communication for device control (when the Control button is selected) and video I/O (when the Video button is selected). The available types of communication are: Ethernet, SCSI, Serial A/1 (serial port 1) and Serial B/2 (serial port 2). Not all type of communication are available on all devices (see table 3-2). Ethernet and SCSI are utilized for DDR devices, while Serial is usually utilized with a VLAN device in conjunction with a VTR. If no DDR or VTR is hooked up, or a camera is attached to your video board, select "none".

Address Window

The address window is used to set the specific address for device control (when the Control button is selected) and video I/O (when the Video button is selected). The Address window is used in conjunction with the Type window, and sets the specific communications address for the selected type of communication. For a DDR in Ethernet mode, enter the network host name of the DDR. For a DDR in SCSI mode, enter the path of the SCSI or disk device under IRIX (refer to the Liberty 6.0 Technical Reference Manual for details). For VLAN control, select the VLAN slave number. For SMPTE control, select the SMPTE address.

Source Button (SRC)

Use this button to configure a VTR as the source VTR. One VTR can be the source VTR while another VTR can be the target VTR. Or the same VTR can be defined as both source and target for grabbing from and recording to the same device. (You can also select a source VTR in the Paint and Animation Environments. Refer to "VTR Set-up Popup" on page 4-435 for details.)

To configure a VTR as the source VTR:

[ ] 1. **Press to call up the Source VTR Popup.** The popup appears.

[ ] 2. **Press on one of the 6 VTRs to select it as Source**.

[ ] 3. **Press the OK button.** The popup disappears.

The Source VTR popup also contains a pre-roll button (for setting the number of seconds of pre-roll for a VTR connected to a VLAN), and a Dropframe button (for turning drop-frame mode on and off for timecodes). In addition, the Source VTR popup also contains buttons for setting up 6 Disk paths, and for re-scaling files grabbed/recorded from/to those disk paths. Disk paths are normally set up in the Paint and/or Animation environment, but the controls are available here and work in a similar manner. Refer to the section starting on page 4-428 for details.

Target Button (Tar)

Use this button to configure a VTR as the target (record) VTR. It works the same as the Source Button.

Comm Button

You shouldn't have to alter the settings in the Comm Button (in fact, this button's popup is only active if a serial control type is selected). If necessary, use this function to set the communications parameters for the control protocol. *(Note that the AMT 7422 DDR has its own Comm popup. Contact Chyron Customer Service for assistance.)*

Press the Comm button to call up the Comm popup with the following functions:

baud

If Control is serial, selects the baud rate. Most common is 9600, except for SMPTE devices which are always 38400 baud.

data

If Control is serial, selects the number of data bits, either 7 or 8. Almost every VTR uses 8.

parity

If Control is serial, selects the parity polarity. "None" is most common, except for SMPTE devices which expect "even."

stop

If control is serial, 1 or 2 stop bits. Most common is 1, some recorders require 2.

The Comm OK Button

Press to confirm changes to the other buttons on the Comm Popup. The Comm Popup disappears.

V Adj Button

Use the Video Adjust button when you are not satisfied with the video signal coming out of the video board. It allows you to adjust the configuration of the specific video board installed on your platform.

Press the Video Button to start the setup application for your installed video board.

The corresponding menus will appear on top of the Liberty menus. If you have questions about the video board application, consult the documentation for the video board or contact the vendor of the video board.

Config (OK) Button

Press the Config Button to confirm all changes you make in VTR configurations.

None of your VTR configuration changes are permanent until you press the Config Button.

Any VTR number that does not have a device associated with it should be configured as "none;" if not, it takes longer to complete the configurations when you press Config and when you login to Liberty. To abort the configuration process after hitting the Config Button, press the gray End key on the keyboard (not the white **Esc** key).

When you exit Liberty after configuring VTRs, your VTR configurations are remembered in the current User Login Account. After you log back in to that User Login Account, Liberty configures the recording devices the first time any of the VTR menus or controls are accessed. If, while using a certain login account, you only use one or two of the total VTRs, configure only those in that login account.

3.8 VIDEO FRAMER® PANEL

When you are using the Video Framer® as your video board, Liberty supplies a panel (below) to choose a video format. Press one of the buttons to choose among RGB, NTSC, PAL, D1, D2, RY, S-Video, and a custom format. The Video Framer video board is used only on a SGI Personal IRIS workstation.

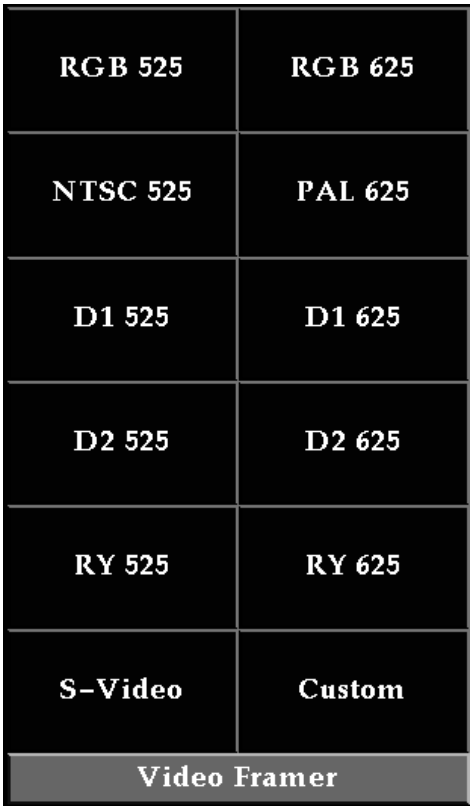

Figure 3-11. Video Framer Panel

3.9 OPTION PANEL

Figure 3-12. The Option Panel

The Options Panel lists the available hardware and software options for LIBERTY, including different video boards and several optional software packages. The options that are enabled for your LIBERTY site are highlighted on the panel. Press on an option to enable (highlight) it. If you press on an

option to highlight it and that option is not licensed, an error message appears. For licensing procedures, see the LIBERTY Technical reference Manual.

3.9.1 Hardware Options

This window lists the video hardware accessories that LIBERTY supports. If one of these video I/O boards or video accessories is installed in your system, select the hardware option so that it is highlighted.

NOTE

It is important to select one installed video board in this list as the Type and Address parameters in the Video Panel will be changed to match the selected video board.

The available video I/O boards are:

Video Board	SGI System
Avion	Indigo 2 w/ LIBERTY (NTSC)
Cindy/Centaur	Indy (Cindy) or Indigo (Centaur)
SGI Galileo	Indigo 2 XL, XZ, EX
SGI IMPACT Video	Indigo 2 IMPACT
SGI VideoFramer	Personal Iris
SGI Octane Video	SGI Octane
SGI O^2 Video	SGI O^2

The supported video accessories are:

HP VidJet Pro	HP LaserJet/InkJet printing accessory

3.9.2 Software Options

This window lists the software options that are available to Liberty systems. To use an option, select the option in the list. When selected, the option will be highlighted. The following software options are available:

- **Expanded Resolution**
- **Motion Tracking**
- **Cinefusion**
- **GIF**
- **TIFF LZW Compression**

Expanded Resolution

While all Liberty products are capable of being resolution-independent, some Liberty products are supplied with a basic configuration that permits a maximum resolution of 1,000 pixels by 1,000 lines. The Expanded Resolution option is available to extend image resolution to 8,000 pixels by 8,000 lines. Expanded Resolution is a standard on Liberty 64, and available as an option on Liberty 32 and Liberty Paint.

Motion Tracking

This module provides three software options:

- **Motion Tracking**
- **Motion Stabilization**
- **Corner Warping**

Motion Tracking is a standard feature in Liberty 64, available optionally on Liberty 32, and not applicable to Liberty Paint.

Cinefusion

This software option provides an interface in Liberty's Animation Environment to the Ultimatte® Cinefusion™ blue screen processing software. The Cinefusion Interface is a standard feature of Liberty 64, available optionally on Liberty 32, and not applicable to Liberty Paint.

License options for GIF/TIFF LZW Compression

Two new licensing options were added for Liberty version 6.0, for the TIFF LZW and GIF file formats. These options are necessary since both these file formats utilize LZW compression, on which Unisys holds a patent and now requires royalties to be paid.

TIFF LZW files are rarely used (also note that Liberty always writes *uncompressed* TIFF files). GIF files, however, are common in World Wide Web graphics, and always use LZW compression.

These two options will automatically be licensed with all copies of Liberty (in other words, the user will automatically receive these options, as Customer Service will include these options with all Liberty licenses).

3.9.3 Active Server

This window lists the name of the workstation that serves as the licensing server. In a node-locked installation, this will be the name of the workstation where Liberty is installed. In an installation with floating licenses, this will be the workstation designated as the license server.

Installing Software Options

When you install new Liberty software, you must enable a license from Chyron. Pressing on a software option in the list (or simply using the corresponding feature in the Liberty software) activates the option. When this occurs, Liberty verifies that the user has a license for that option. Refer to the Liberty Technical Reference Manual for instructions on obtaining and installing Liberty licenses.

Press on the Install Option Button to license Liberty.

3.10 CURSOR PANEL

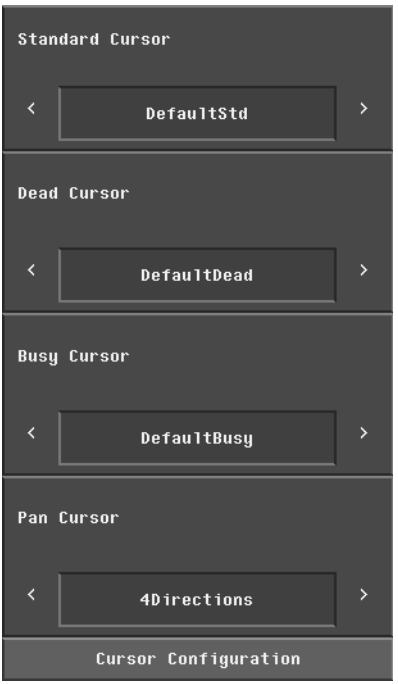

Figure 3-13. The Cursor Panel

Use the Cursor Panel to choose one of Liberty's cursor styles.

There are four kinds of cursors:

- **The standard active cursor.**
- **The "dead' cursor that is displayed when the cursor is over a menu area that is currently unusable.**
- **The "busy" cursor that is displayed when Liberty is occupied with a computation or rendering, temporarily impeding operation.**
- **The "pan" cursor that is displayed when you pan the magnified Canvas by dragging the pen on the Canvas with the Alt keyboard key pressed.**

Cursor Selection Buttons

Press one of the arrow buttons on either end of the Cursor Selection Buttons to cycle through the list of cursor styles.

As you cycle through, the standard cursor is displayed as the current cursor. The current four cursors are operative throughout all of Liberty's functions.

3.11 TABLET PANEL

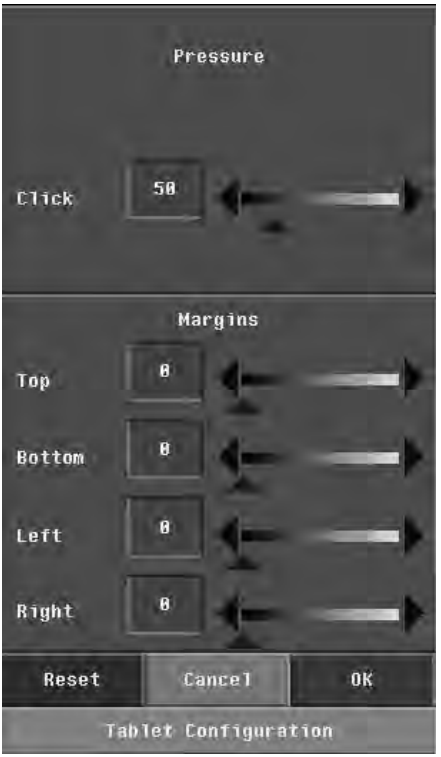

Figure 3-14. The Tablet Panel

Use the Tablet Configuration Panel to change the pen pressure settings and the margins of the active tablet area. You can use the margin sliders to set the active area of the tablet to be any size or aspect ratio: operation is automatically adapted to Liberty's menu and Canvas areas.

Tablet Click Pressure

This sets the required pressure for a positive click on the tablet. Its scale extends from 0 on the left to 255 on the right, with a default of 50. Generally, you want the Click setting to be as low as possible without causing mistaken, unintentional clicks on the tablet.

Tablet Top Margin

This sets the top margin of the active tablet area. Its numbers refer to inches on the tablet. After changing the setting, press the OK Button to accept the change.

Tablet Bottom Margin

This sets the bottom margin of the active tablet area. Its numbers refer to inches on the tablet. After changing the setting, press the OK Button to accept the change.

Tablet Left Margin

This sets the left margin of the active tablet area. Its numbers refer to inches on the tablet. After changing the setting, press the OK Button to accept the change.

Tablet Right Margin

This sets the right margin of the active tablet area. Its numbers refer to inches on the tablet. After changing the setting, press the OK Button to accept the change.

NOTE

The tablet configuration settings may not be changed when using a mouse as a pointing device.

Reset Button

Press the Reset Button to return the tablet settings to their original default values.

Cancel Button

Press the Cancel Button to cancel any changes you've just made to the slider settings and return them to their previous settings.

OK Button

Press the OK Button to confirm the changes you've made to the slider settings.

3.12 UNDO PANEL

Figure 3-15. Undo Configuration Panel Illustration

Use the Undo Panel to set the number of levels of Undo that Liberty will provide.

There are separate controls for Canvas, Temp, Layers, and Mask, each with a user configurable number of levels, and an On/Off button. Thus, the number of levels of Undo, and whether undo is on or off, is separately controllable for Canvas, Temp, Mask, and Layers.

4.1 PAINT ENVIRONMENT DESCRIPTION

The Paint Environment is one of Liberty's two main working environments. Image creation is performed in the Paint Environment. Paint includes several Panel Menus that appear in the four Panel Menu positions below the main picture display (Canvas).

Liberty Paint Environment

The initial display of the Liberty Paint Environment appears as shown in ***Figure 4-1***:

Figure 4-1. Paint Environment

Here are some of the main features of the Paint Environment:

Environment Buttons

Figure 4-2. Environment Buttons

These four buttons are in the lower left corner of the screen. They are from left to right:

P ..... The Paint Environment Button

A ..... The Animation Environment Button

C ..... The Configure Environment Button

L..... The Login Environment Button

Pressing any Environment Button calls up that environment. These environment buttons appear in every environment except Login (which has similar but larger buttons for choosing environments). ***The Animation Environment is not available to Liberty Paint users.***

Canvas

The Canvas is the primary working image area. Pictures can also be held and manipulated in Temporary Buffers (Temps), but you do most of your work on the Canvas. When you recall a picture from the disk, normally it appears on the Canvas. When you recall a picture larger than the maximum displayable area on the Canvas, it is partially displayed and you

can scroll around on it. Pressing the Full Button at the bottom right of the screen displays the entire picture on the Canvas, regardless of its size.

NOTE

To be able to display the whole image file, the canvas resolution must be configured to be the same as, or larger than, the image resolution. An image file recalled into a smaller canvas size will be displayed in the available canvas resolution starting at the lower left corner. See *page 3-21* for more information on canvas resolutions.

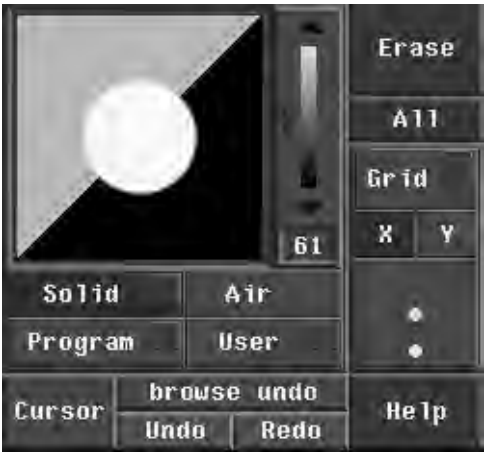

Figure 4-3. Brush Panel Illustration

Undo Functions

Figure 4-4. Undo/Redo Buttons

Liberty provides a user-configurable number of levels of Undo for Canvas, Temp, Roto Layers, and Mask, controlled through the Undo Panel in the Configuration Environment. The default number of Undo is 7 each for Canvas, Temp, Roto Layers, and Mask. The number of levels is limited only by disk space. Once the number of levels has been set, a level is saved each time the Canvas or Mask is changed. Pressing the main Undo Button (near the Brush Display) one or more times undoes the last one or more operations to either the Canvas, temp or the Mask, depending on which was changed last. Redo functions in a similar manner. Roto Layers Undo is off by default and is used only while rotoscoping with layers.

There are individual Canvas, Temp and Mask Undo Buttons in the Buffers Panel, allowing you to specifically undo the last Canvas operation, the last Temp operation or the last Mask operation.

The Browse Undo Button brings up the Undo Popup, which displays browse images of all the Canvas, Temp, Roto Layers and Mask images currently saved.

See ***page 3-57*** for details about setting the number of Undo levels in the Configuration Environment.

Undo Button

Press this button to undo the last operation, whether it was Canvas, Temp, or Mask. Pressing the Undo Button repeatedly undoes the last series of operations, up to the number of levels set.

Redo Button

Press this button to redo the last undo, whether it was Canvas, Temp, or Mask. Pressing the Redo Button repeatedly redoes the last series of undone operations.

Undo Popup

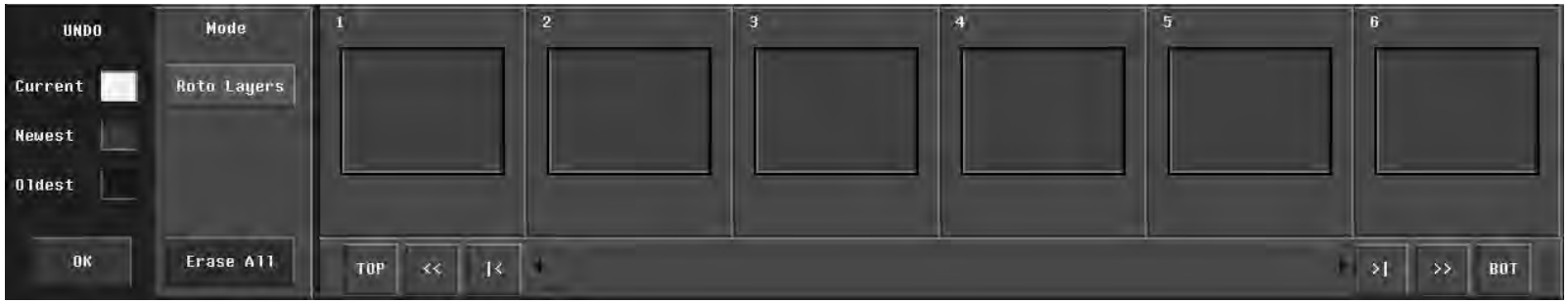

Figure 4-5. Undo Popup

Press the Browse Undo Button to call up the Undo Popup. It displays browse images of all the levels of Undo. Six browse images fit on the normal screen, but if you have more levels of Undo you can scroll the popup left and right to see all the browse images. Controls are provided for scrolling and for deleting the Undo levels.

One set of Undo images can be browsed at a time (Canvas, Temp, Mask, or Roto Layers). A colored mode button selects the current mode to browse. Browsers for each Undo image are displayed (six images at a time). Each image is numbered (the number is at the upper left of the browse image). A slider at the bottom of the Undo Popup is used to scroll through the available Undo images (assuming there are more than six levels configured). When the slider is all the way to the left, the first six images are displayed. When it is all the way to the right, the last six images are displayed. Moving the slider from left to right scrolls through the images. In addition to the slider, there are these six control buttons:

Top	Displays the first six levels.
<<	Scroll left by one level.
|<	Scroll left by six levels.
>|	Scroll right by six levels.
>>	Scroll right by one level.
Bot	Displays the last six levels.

Erase All erases all levels of undo for the current mode (Canvas, Temp, Mask, or Roto Layers).

Undo/Redo Buttons on The Buffers Panel

Figure 4-6. Canvas and Mask Buffers

On the Buffers Panel, just to the left of the Canvas Temp, and Mask browse images, are small Undo and Redo Buttons, labeled “U” and “R” respectively. Press the U and R Buttons next to the Canvas browse image to undo or redo, respectively, only the last Canvas operation (or series of operations). The Temp and Mask U and R buttons work in the same way.

Prompt Window

Figure 4-7. Prompt Window and the Canvas Button

The wide text window running across the middle bottom of the screen, where alphanumeric information about the current function is displayed. The left 80% of the window displays system messages, the name of the current function, help information, etc. The right 20% displays the numeric value of the current function and allows numeric entry to modify the value of the current function.

Pressing in the right end of the prompt window calls up the calculator (see ***page 4-67***.)

Canvas Button

The Canvas Button is at the bottom of the Paint Environment screen near the right side. Pressing this button causes the canvas to fill the entire SGI screen, replacing the menus. The "Canvas" button then changes to read "Menus" to allow restoring the menus to the screen. *The F8 key on the keyboard performs the same function as the Canvas Button.*

NOTE

When you press the Canvas Button, it automatically zooms the Canvas image so that it fills the screen. The exceptions to this are (1) If you've already zoomed when you press Canvas, your current magnification is preserved, and (2) If the image is too big to fit into the standard Canvas screen no zoom is performed.

Erase Button

The red buttons at the top of the screen next to the Brush Display are the Erase Buttons. Pressing the main Erase button once erases the masked area in the picture (see the section on Masks.)

NOTE

When erasing a masked area - on some hardware platforms after you press Erase once, there is a pause before the masked area is erased.

All Button

The smaller red button below the Erase button is the Erase All button. Pressing the All Button twice quickly erases the entire Canvas, regardless of any masked areas.

Prefix Buttons

Figure 4-8. Prefix Buttons

Prefix buttons are used to modify functions. After they are pressed, the next function pressed will perform differently than normal, depending on the prefix. Prefix Buttons are Repeat, Under, Add, Copy, and Invert. For example, pressing the Under Prefix Button, then the Paint Button, causes painting to happen under, instead of over, what's on the Canvas. The Prefix Buttons are located about two-thirds of the way down the left side of the Paint Environment. See ***"Repeat Prefix Button" on page 4-60*** for more information.

Popup Menus

Many functions can call up their own popup menus for more options or detailed control of the function. Any button with a small square corner button in the button's upper right corner has a popup. Pressing the corner button displays the popup. For instance, pressing the corner button in the Paint Button displays the Paint Gap Popup, where you can set the distance of the space between "pen-downs" when painting.

Green OK and Yellow Cancel Buttons

You confirm an operation in a popup by pressing a green OK button (all OK buttons are green), at which time the operation is performed and the popup disappears. Or you can cancel the operation (and remove the popup) by pressing the yellow Cancel Button.

Transparency

All of Liberty's functions and pictures operate with full-color and full-transparency. In the 32-bit version of Liberty, color goes on the screen at any of 256 levels of transparency. In the 64-bit version of Liberty, color goes on the screen in from zero to

65,535 levels of transparency. Transparency is controlled by the Transparency Slider Scale (see ***page 4-23***.)

Transparent Background

The transparent background is what remains when you erase the entire picture screen. This background has its own color called the Background Color, which can be set to any color in the Palette Display.

Filtering and Anti-aliasing

All Liberty functions are fully anti-aliased, meaning that everything is filtered to create smooth but crisp edges. This filtering can be turned off or modified, if desired with Clamp Mask, for example. The Solid Brush mode has a popup that lets you modify the softness of the brush's edge, all the way down to no anti-aliasing at all. Likewise, Paste Distort, Liberty's perspective transform function, allows several different rendering filters.

Elevators

User-defined elements can be stored in "elevators" so that many elements are on-line. For instance, above the color palette is a horizontal row of eight little squares, each of which, when pressed, calls up another palette. Thus eight palettes are instantly accessible. Many functions have elevators, including palettes, temps, masks, user-defined brushes, and text fonts. See ***"Color Slider Scales" on page 4-46*** for an example.

Figure 4-9. Four Panel Positions

Panel Menus

The Paint Environment has space for four panels of buttons across the bottom half of the screen. These are the movable Panel Menus. From left to right, the default Panel Menus are the Transfer Panel, the Paint Panel, the Image Tools Panel, and the Mask Tools Panel. These are the most frequently used Panel Menus.

The Panel Menus are interchangeable; that is, any Panel Menu can be in any of the four positions. Use the row of colored Panel Call Buttons below the panels to put any Panel Menu into one of the four positions. Generally, it's good to keep the Transfer Panel in the leftmost position and the Mask Tools Panel in the rightmost position, because these two panels are constantly in use. Using Liberty is easier and more efficient when these panels are kept in familiar positions. Use the middle two positions to call up other panels as desired. Several of the panel menus have multiple layers, indicated by small right and left arrows in the panel's title bar. These include the Image Tools, Mask Tools, and Text Panels. Press on either end of the title bar to display another layer of panel functions.

Panel Call Buttons

Figure 4-10. Panel Call Buttons

The row of colored buttons across the bottom of the screen (above the Prompt Window) are the Panel Call Buttons. Press one of the Panel Call Buttons, then press in one of the four panel positions, and a

Panel Menu will appear in that position. The Panel Call Buttons are, from left to right, Transfer, Paint, Tools, Mask, Text, Macro, VTR, and Disk.

4.2 PAINT BRUSHES

Painting is accomplished in Liberty by using one of the four basic types of paint brushes - Solid Brush, Air Brush, Programmed Brush, and User-defined Brush. You can vary the size of all brushes in real time. The currently chosen palette color determines the color of the brush and the setting of the Transparency Slider Scale determines the transparency of the brush.

4.2.1 Current Brush Display

Figure 4-11. Brush Display

The Current Brush Display is a large box at the upper left corner of the Paint Environment. It shows the current size, color, and transparency of the cur-

rent brush. The background of the brush display can be a single color or diagonally divided between two colors, which better displays the transparency of the brush. Press anywhere in the Current Brush Display background to toggle between these two modes.

Color of Displayed Brush

To make the displayed brush remain a constant, fixed color, choose (underline) the palette color you want the brush to be, then press the Copy Prefix Button and press the center of the displayed brush.

To make the displayed brush show the currently chosen color again, turn off all palette colors, press the Copy Prefix Button and press in the center of the displayed brush. This is the default.

Color of Brush Background

To change the colors in the Current Brush Display (if necessary, see ***page 4-33*** for more detail on the use of the palette):

- **When the Brush Display background is two colors, press the Copy Prefix Button.**

- **Press in the top left of the Brush Display background.** The top left part of the Brush background becomes the currently chosen (underlined) palette color. If no color is chosen in the palette, the top left part of the Brush background becomes the background color of the Canvas. This works the same for the bottom right part of the Brush background.

  Or:

- **When the Current Brush Display background is a solid color, press the Copy Prefix Button.**

- **Press anywhere in the Brush background.** The entire Brush background becomes the currently chosen palette color. If no color is chosen in the palette, the entire Brush background becomes the background color of the Canvas.

Brush Size Slider Scale

Change the brush size using the vertical slider scale at the right of the Current Brush Display. Press and drag to move the slider up and down to change the size of the current brush in real time. All four brush modes are sizable in real time.

The number window below the Brush Size Slider Scale displays the current size of the brush in pixels. Press in the number window to enter the brush size via keyboard. Press on the arrow buttons at the top and bottom of the slider scale to change the value by one unit at a time. The scale goes from 1 at the bottom to 127 at the top.

Transparency Slider Scale

Figure 4-12. Transparency Slider (in the Palette Panel)

The setting of the Transparency Slider Scale determines the transparency of the brush. The Transparency Slider is the rightmost of the four sliders in the Palette Display. *To see the Transparency Slider, the Palette Display must be showing - if it is not, press the Palette Button.*

Press on the slider and drag it up and down to change the current transparency value. 100% opaque is at the top, 100% transparent at the bottom. This slider scale controls the transparency of painting, as well as most functions that put color or image into the picture, such as Paste, Text Render, Apply Color, etc.)

Press on the arrow buttons at the top and bottom of the slider scale to change the value by one unit at a time. In the 32-bit version of Liberty, the scale goes from 0 at the bottom to 255 at the top. See page 4-33, the Color Palette.

NOTE

The Transparency Slider stays at its current setting until you change it. Since it controls most ways of putting color on the Canvas, it's important that it is set where you want it. Make it a habit to check frequently to see that its setting is where you expect it. If the setting is nearly at the top, but not quite, you'll get images that are not quite opaque which, though perhaps unnoticeable now, may cause problems later when you re-use the element in different ways.

Cursor Button

Press the Cursor Button to display the Cursor Popup, which gives you a choice of what to display while you are painting.

The Cursor Popup

Figure 4-13. Cursor Popup

The Cursor Popup allows you to choose from three modes: Brush Only, Cursor Only, and Both (the default is Both). When Brush Only is on, as you paint only the brush is displayed. When Cursor Only is on, as you paint only the cursor is displayed in place of the brush. When Both is on, you see both the brush and the cursor displayed while you paint. A displayed cursor is useful for painting with hard-to-see brushes, such as very small or very transparent brushes, or when painting in a color that is hard to see. Cursor display works in all brush functions.

4.2.2 Brush Mode Buttons

The four brush modes are: Solid Brush, Air Brush, Programmed Brush, and User Brush. They are accessed by the four buttons below the Current Brush Display. Press any one of these buttons to activate it; only one can be active at a time. You can size all brushes in real time with the Brush Size Slider Scale.

Solid Brush Button

Figure 4-14. Solid Brush Popup

Press the Solid Brush Button to choose a round brush with crisp edges.

To vary Solid Brush edge softness:

- 1. **Press the corner button of the Solid Brush Button.** The Solid Brush Popup appears.
- 2. **Move the slider scale up and down to the desired value.** The top of the slider scale produces an edge with maximum softness; the bottom produces an edge with maximum sharpness (at the bottom the edge has no anti-aliasing at all). You can press the number window under the slider to enter a value via the keyboard. You can press the Reset Button to set the brush edge back to its default value.
- 3. **Press the OK button to confirm the new value and remove the Popup Menu.** The Solid Brush appears in the Brush Display with its new edge setting.

Air Brush Button

Press the Air Brush Button to choose a round brush with soft edges. The air brush has no popup menu; you can create custom air brushes with different kinds of edges using the Programmed Brush.

Programmed Brush Button

Press the Programmed Brush Button to choose the current Programmed Brush.

The Programmed Brush allows you to create custom air brushes with an infinite variety of edge profiles, as well as many other customized round brushes.

The Programmed Brush Diagram Popup

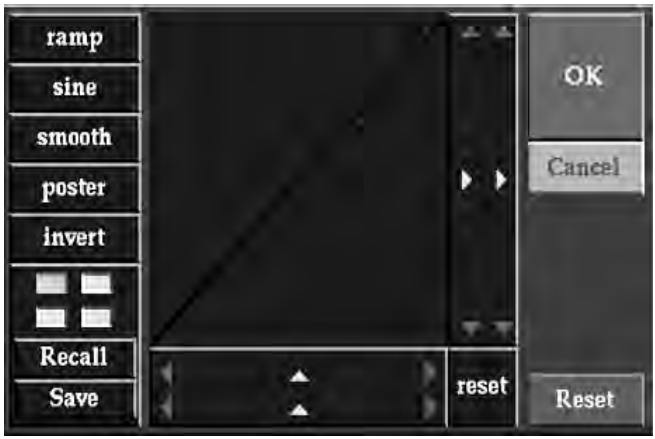

Figure 4-15. Programmed Brush Popup

The Programmed Brush Diagram Popup is basically the same Diagram Popup that is used to modify other Liberty functions, such as the distribution of ramped colors in an Apply or the clipping of a Mask. Here the Diagram represents the profile of the current Programmed Brush. Modifying the Diagram Curve modifies the shape of the current Programmed Brush (see page 4-371).

The Diagram Curve allows you to graphically and interactively modify the Programmed Brush starting with a basic air brush. The Diagram Curve shows one half of the current brush. The top of the curve is maximum opacity; the bottom of the curve is maximum transparency. The left of the curve is the brush edge; the right of the curve is the center of the brush.

To create a programmed brush:

- 1. **Press the corner of the Programmed Brush Button to display the** Diagram Popup Menu.

- 2. **Modify the Diagram Curve.** Each time you lift the pen after modifying the curve, the changes are displayed in the Current Brush Display. The Sine button creates Liberty's standard Air Brush.

- 3. **Press the green OK Button.** The brush defined by the new diagram curve is confirmed in the Brush Display and can be scaled.

Use the Programmed Brush like any other brush.

One way to permanently store your custom-created Programmed Brushes is to save the Diagram Curve on disk, using the Save Button in the Diagram Popup. Or you can make a copy of it on the Canvas and make a User-defined Brush out of it. User-defined Brushes can also be stored on disk (see page 4-32.)

NOTE

Changing the amount of fall-off (steepness of the curve) strongly affects some Paint Mode functions, such as Touchup Paint.

User Brush Button

Figure 4-16. User Brush Popup

The User Brush allows you to create a brush from any image on the Canvas, up to 120 pixels square. Regardless of its original on-screen color, after it has been defined, the User Brush paints using the current color in the Palette, like the other three brush modes.

Press the User Brush Button to choose the current user-defined brush.

NOTE

If you have just booted up the system, there is no current user-defined brush loaded. Pressing on the User Brush Button automatically calls up the User Brush Popup Menu so you can choose a user-defined brush from the popup.

To change the current User Brush:

[ ] 1. **Press the corner button of the User Brush Button.** The User Brush Popup appears, displaying ten of the existing User-defined Brushes.

[ ] 2. **Press on one of the brushes to choose it.** The chosen brush is underlined and the chosen brush appears in the Current Brush Display.

[ ] 3. **Press the OK Button.** The popup disappears.

To create a User Brush:

[ ] 1. **Create a small image on the Canvas for your User Brush.** You can use Paint, or Curve Draw, or any other function to create the source image for the User Brush. If desired, first make it large, then scale it down with Paste Distort (see index) to fit into a 120 pixel square.

[ ] 2. **Mask the image on the Canvas.** The image for the User brush must be the only thing masked on the Canvas. If the brush is the only thing on the Canvas, you don't have to mask it.

[ ] 3. **Press the corner button of the User Brush Button.** The User Brush Popup Menu appears.

[ ] 4. **Press one of the boxes in the User Brush Elevator.** The box becomes underlined.

[ ] 5. **Press the Define (Def) Button.** The masked image on the Canvas appears in the chosen box in the User Brush Elevator.

[ ] 6. **Press the green OK Button.** The User Brush Popup disappears and the new User Brush appears in the Current Brush Display.

The User Brush Popup

The User Brush Popup Menu displays the on-line User-defined Brushes created in Liberty, as well as tools for the creation and modification of User-defined Brushes. You can have as many as 80 User-defined Brushes on-line in the User Brush Elevator.

The User Brush Elevator

Press on one of the 8 levels to choose it and display its 10 brushes.

The User Brush OK Button

When you press the OK Button to confirm your choice of User Brush, the underlined User Brush is installed into the Current Brush Display and the User Brush Popup disappears.

The User Brush Hard-edge Button (Hard)

Clamps all transparency in the current user brush to full opacity (255). The result is a hard-edged (aliased) brush. Like Normalize, this affects only the display of the brush in the Current Brush Display, not the original user brush in the popup.

The User Brush Normalize Button (Norm)

Normalizes the current brush. If the brush does not contain all alphas (transparency levels) from 0 to 255, the range is stretched before it is displayed in

the Current Brush Display. Normalize affects only the display of the brush in the Current Brush Display, not the original user brush in the popup.

The User Brush Save Button (Save)

Saves the current elevator level of brushes to disk. Saves all ten brushes.

The User Brush Recall Button (Recall)

Recalls a previously saved set of ten brushes into the current elevator level. Replaces all ten brushes in the current level.

The User Brush Define Button (Def)

Press the Define Button when you have masked the on-Canvas area you want to turn into a User-defined brush. See page 4-30 for a step-by-step description of using Define to create a new User-defined Brush.

4.3 COLOR PALETTE

4.3.1 Palette and Buffers Panels

Figure 4-17. Palette Panel

The Color Palette Panel alternates with the Buffers Panel, using the same menu space at the left of the screen below the Brush Display. If the Buffers Panel is displayed (you'll see a stack of three small

representations of the Canvas, Temp Buffer, and Mask Buffer) you press the button labeled Palette to call up the Palette Panel in its place. Likewise, if the Palette is displayed, press the button below labeled Buffers, and the palette will be replaced by the Buffers Panel. While working in the Paint Environment, you will frequently change back and forth between these two panels.

About the Palette

Liberty's Color Palette offers a choice of over 16 million colors (32-bit mode) displayed in 8 sets of palette boxes in the Color Palette Elevator. You can modify each color box individually by adjusting the color slider scales below the palette, or by picking a color from the Canvas. You can modify colors singly or in groups. Each time you save a picture on disk, all the current palette colors are saved at the same time. When you recall a picture, all its palette colors are recalled with it. However, you can recall palettes or pictures independently of one another. *To recall a picture without its stored palette, use the "Ignore Palette" button in the Transfer Panel's Recall Popup.*

Press on a color palette box to choose it as the current color (it becomes underlined). The current color is displayed in the Current Color Box. If no color palette box is chosen (underlined), then Paint functions act as Erase-Paint; that is, they paint with the transparent background color of the Canvas.

Color Palette Elevator

The Color Palette Elevator is the row of 8 small boxes (levels) above the Color Palette. The default palette is the leftmost box, but you can press on any level to activate it and display its palette. Each level

contains a palette of 32 colors. You can copy one level to another level and link some or all of the levels to one another, if you want to work with large numbers of colors at one time.

To copy one palette level to another:

- **Press the elevator level you want to copy.**
- **Press the Copy Prefix Button**.
- **Press the elevator box you want to copy to.** The source palette appears in the target palette.

Color Palette Functions

The Color Palette Functions allow you to work with groups of colors and to modify them in a variety of ways. This is useful when, for instance, creating a multicolored ramp. Located below the color palette, the Color Palette Functions include:

Multiple	**Clear**	**Swap**	**Pick**
Global	**Inverse**	**Shift**	**Blend**

The Multiple Colors Button (multi)

When Multiple Colors Mode is on, more than one color can be chosen (underlined) simultaneously. Multiple Colors Mode is used mainly to blend colors and to create color ramps (gradations) with the Apply Color Button in the Image Tools 1 Panel. When Multiple Colors Mode is on, pressing on a palette box underlines it, and pressing on an underlined palette box removes the underline (becomes unselected). You can underline palette boxes in several palettes at the same time on the Palette Elevator when Global Mode is on (see below).

When Multiple Color Mode is on, the topmost, left-most underlined palette box is displayed in the Current Color Box and is used for functions that use a single color, like Paint.

When you turn off the Multiple Color Mode, Liberty remembers the underlined colors so that when you turn Multiple Colors back on, the same color boxes are underlined as before.

For information on how to manipulate multiple colors using the Color Slider Scales, see page 4-42.

The Global Palette Button

When The Global Button is turned on, all 8 palettes in the Palette Elevator are active. If the Multiple Color Button is also turned on, any number of colors up to 256 can be chosen (underlined) simultaneously.

Pressing the Clear Color Button while Global Palette Mode is turned on un-chooses (removes the underlines from) all underlined palette boxes in all palette levels.

If you turn off Global while Multiple Color Mode is still on, Liberty re-underlines the palette boxes that were last underlined before you turned Global on.

Generally, you should keep Global Mode turned off unless you are using it for a specific purpose, lest you forget it and think you're operating in the displayed palette only.

The Clear Color Button

Press the Clear button to turn off (remove underlines from) all palette colors in the current palette. If Global is turned on and more than one palette is active, all underlined colors in all palettes are turned off.

The Blend Colors Button

The Blend Colors Button requires Multiple Colors Mode to be on and three or more colors to be underlined. When you press Blend, all underlined colors are ramped, or blended, between the first and last underlined colors, starting with the topmost, leftmost palette box. Blended colors need not be adjacent on the palette. You can underline several colors, skipping colors between, and only the underlined colors will be blended. When Global Mode is on, you can make a "ramp" with up to 256 colors.

To make a blended color ramp between two colors in the Palette:

- **Turn on Multiple Colors Mode**.
- **Underline three or more colors in the palette.**
- **Press the Blend Button.** A ramp is created in the palette from the first to the last underlined color, in equal steps of Hue, Saturation and Brightness.

The Inverse Colors Button

With Multiple Colors Mode on, press Inverse to turn on all colors except those currently underlined. In Global Mode, Inverse works with all palettes simultaneously. To quickly turn on all colors in the palette, press the Clear Button, then the Inverse Button.

The Swap Colors Button (<->)

With Multiple Colors Mode on, press Swap to reverse the order of the chosen colors. With Global Mode on, Swap affects all palettes simultaneously.

The Shift Colors Button (< >)

With Multiple Colors Mode on, press the right half of the Shift Button to cycle the underlined colors one to the right, or press the left half of the Shift Button to cycle the underlined colors one to the left. With Global Mode on, Shift affects underlined colors in all palettes simultaneously.

The Pick Color Button

Other than the Color Slider Scales, Pick Color is the main way to set colors in the palette. You can use Pick any time to pick a color from the picture in the Canvas. The Pick Popup gives you more options for control over the Pick Functions. You also can use Pick functions in conjunction with Channel Mask for modifying masks.

To Pick colors from the Canvas to the palette.

- **Press the Pick Color Button.** Single Color Mode should be on.

- **Press on the color in the Canvas you want to pick up.** The "picked" color appears in the currently chosen (underlined) palette box and in the Current Color Box. The Prompt Window displays the XY screen position that you pressed, the numeric values of the color, and the XY distance from the last Picked position (You can use Pick Color just to measure pixel distances in the picture).

Here is a sample reading of Picked values in the Prompt Window:

X, Y: 101, 233 (HSVA: 0-0-144-144) dx, dy: -5.27, 2.06.

X and Y values are read from the lower left corner of the Canvas. The color values for Hue, Saturation, Value, and Alpha are expressed on a 0 to 255 scale. The distance (dx, dy) from the last Picked position are expressed in plus and minus values. A minus dx is a distance to the left, a plus dx is a distance to the right. A minus dy distance is a distance toward the bottom, a plus dy is a distance toward the top.

To Pick a series of colors:

- **Press the Repeat (Rept) Prefix Button.**
- **Press the Pick Color button.**
- **Press repeatedly on various colored areas in the Canvas.**

If no color is chosen (underlined) in the palette, RGB and XY data is printed in the Prompt Window for each position picked, but no colors are actually copied into the palette. If one color is chosen in the palette, colors picked repeatedly in the picture are copied into the next palette box in the palette, and the next, and the next, until you press the Pick Button again to turn it off (Don't forget to turn off the Repeat prefix as well).

This is a fast way to create a multicolored palette from the picture. If Multiple Color Mode is on, the colors you pick on the Canvas are copied into the underlined colors until all underlined colors have been changed.

Pick Colors Popup

Figure 4-18. Pick Colors Popup

The Pick Colors Popup (Figure 4-18) has more options for Pick Color functions. Press the corner button in the Pick Button to call up the Pick Popup.

The Strip Background Color Button

Press the StripBG Button to turn it on/off. When on, Pick Color ignores the transparent Background Color in the picture, so that the pixel being Picked is treated as if it is 100% opaque, regardless of the background color or opacity level.

The Real-time Mode Button

Press the Real-time Mode Button to turn it on/off. When on, Pick operates continuously in real-time while the pen is pressed down. Each pixel crossed by the pen is Picked, so that the currently underlined color changes in real-time. The Color Sliders adjust continuously as well.

The Distance Settings

Press one of the Distance Setting Buttons - pixels, inches, or millimeters - to turn it on. The distance from the previous Pick displayed in the prompt Window is displayed in pixels, inches, or millimeters. Only one can be on at a time. The inches and millimeters settings are determined by the Dots Per Inch (DPI) setting in the Configure Environment. For SGI monitors, the DPI default is 100.

The Display Settings

The Display Settings allow you to choose whether to show the color values of the Picked color in a percentage or on a scale from 0 to 255.

Press the %age Button to turn it on. The color values of the Picked color are shown as a percentage (0 to 100).

Press the 255 Button to turn it on. The color values of the Picked color are shown on a scale of 0 to 255.

The Averaging Functions

Depending on which Averaging Setting is active, the Pick function averages neighboring pixels into the Picked color.

Press on one of the Averaging Settings to turn it on. The Pick function averages a number of surrounding pixels to arrive at the resultant Picked color. The Off Setting uses only the single pixel pressed on. The other settings range from 2 x 2 to 9 x 9. 2 x 2 averages a 2 x 2 square group of pixels, with the Picked pixel at the lower left. 3 x 3 averages a 3 x 3 square group of pixels with the Picked pixel near the center. The larger settings operate the same way with the Picked pixel in the center of the square of averaged pixels.

Color Space Button (HSV)

Displays the current color space (RGB, HSV, CMYK, HSL etc.). Press this button to call up the Color Space Popup for choosing which color space to use or to call up the Color Mixer.

4.3.2 Color Modes

When the green Color Space button is pressed, the Color Mode Popup appears. The button will be labeled HSV, RGB, CMYK, or HSL depending on the currently selected Color Mode.

Figure 4-19. Color Space Popup

Color Checking

This tool when activated will provide an indication of whether the currently selected color(s) are within legal NTSC or PAL color space.

NOTE

This tool will not affect the colors of the canvas pixels. It only identifies illegal palette colors. See The Color Clip Button description on for more information on clipping the Palette colors.

NTSC Button

Press the NTSC button to enable (highlight) NTSC Color Checking. When active, if a selected color is legal, there will be a white select line under the color chip. If the color is illegal (e.g. not in legal NTSC color space) the white select bar beneath the color chip will turn red. *Adjust the color sliders to make the color legal.*

PAL Button

Press the PAL button to enable (highlight) PAL color checking for the selected palette color(s).

Gamma Window

The value in this window is used by Liberty in the algorithm that converts from RGB color space to NTSC or PAL color space. The default value is 1.600. Increasing the number raises the gamma curve, and using a smaller number lowers the gamma curve.

HSV Button

Configures the Color Sliders for Hue, Saturation, Value, and Alpha palette color control.

RGB Button

Configures the Color Sliders for Red, Green, Blue, and Alpha palette color control.

CMYK Button

Configures the Color Sliders to Cyan, Magenta, Yellow, and Black palette color control.

HSL Button

Configures the Color Sliders to Hue, Saturation, Luminance, and Alpha palette color control.

Color Mixer

Brings up the Color Mixer popup instead of the Color Sliders for palette color control.

4.3.3 Color Slider Scales

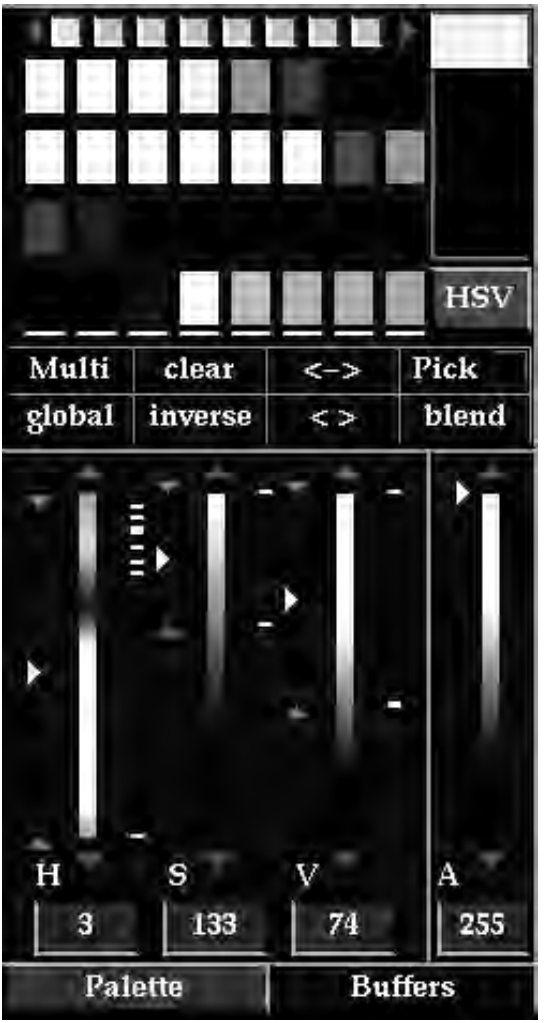

Figure 4-20. Color Slider Scales in the Palette Panel

The more than 16.7 million colors available to Liberty's 32-bit version are set using these three slider scales. There are four different color spaces you can use to modify colors in. The default is Hue, Saturation, and Value (HSV).

Color Sliders Space Control

To change the Color Slider Scales to operate in Hue, Saturation, and Value (HSV); Red, Green, Blue (RGB); Cyan, Magenta, Yellow, Black (CMYK); or Hue Saturation, Luminance (HSL) Color Space, press on the green Color Space Button at the bottom of the Current Color Button. When the Color Space Popup appears, press on the Color Space you want to work in.

HSV Color Space

The Hue slider scale, at the left, controls the hue of the current color(s).

The Saturation slider scale, the middle of the three, controls the saturation, or intensity, of the current color(s) The top of the scale is 100% saturation and the bottom is 0% saturation. The closer to the bottom the more pastel the color is. The Saturation scale overrides Hue and is overridden by Value.

The Value scale, the rightmost of the three, controls the brightness of the current color(s). The top of the scale is 100% brightness and the bottom is 0 brightness or black. Value overrides both Hue and Saturation.

RGB Color Space Control

RGB represents color in terms of the three additive primaries of color television. Black is created by setting all three sliders to the bottom, and white is created by setting them all to the top.

CMYK Color Space Control

CMYK is the Color Space for pre-press applications like desktop publishing and represents the three primary ink colors: Cyan, Magenta, and Yellow, plus

black (K). Cyan, Magenta, and Yellow are subtractive, since when they all equal 255 they give black, and when they are all at 0 they give white. Liberty provides other tools for pre-press, such as file conversion to and from Scitex file formats in the Save and Recall Popups. The four sliders represent C, Y, M, and K from left to right.

HSL Color Space Control

This color space is similar to HSV but has a Luminance (L) parameter that is proportional to brightness levels measured on an NTSC monitor. The top of the luminance scale is white; the middle is color; and the bottom is black. Luminance also takes into account the brightness of different colors, i.e. red is darker than yellow. HSV treats pure hues as having equal weight and so may be used for color paint applications. HSL gives different weight to different hues and would be used when different hues must be distinguished by their brightness, as in choosing colors that must be distinguishable even on a black and white TV monitor.

Color Mixer Mode

Figure 4-21. Color Mixer Popup

The Color Mixer provides an area for mixing colors separate from the Canvas. The Color Mixer consists of a rectangular area for mixing colors and four buttons: "Real," "Adjust," "Edit," and "Clear."

- **To display the Color Mixer:** Press the Color Space button. When the Color Space Popup comes up, press on the Color Mixer Button, followed by the OK button.

- **To put color into the Color Mixer:** Press the Edit Button to enable painting directly into the Mixer area. After you've painted some colors into the Mixer, use Smear Paint to smear the colors around, creating a range of colors to choose from. Most paint modes, such as Reveal, Erase-Paint, and pressure-sensitivity, work with the Mixer. Clone Paint and Paste Paint do not work with the Mixer.

- **To put color from the Color Mixer into the Palette:** When the Edit Button is turned off, pressing in the Color Mixer area picks the pressed-on color into the currently underlined color box in the Palette.

Edit Button

A mode button that enables you to paint directly into the mixer.

Clear Button

Clears the Color Mixer of color.

The Real Button

Real time color pick. When this mode button is on, as you press down and drag the cursor over the Mixer area the current color box is continuously updated with the corresponding color.

Repeat Prefix with the Color Mixer

With the Real Mode off and the Repeat Prefix on, pressing continuously on the Mixer area fills all the palette boxes in the Palette with colors from the mixer.

Adjust Button

This allows you to modify the entire Mixer area using HSV sliders.

Single-Color & Multi-Color Modes

The Color Slider Scales work both in Single- and Multi-color Modes. In Single-color Mode, they show the values for the single current color. In Multi-color Mode they show the values for the range of underlined colors.

In Single-color Mode each slider scale has one pointer indicating its setting. In Multi-color Mode each slider scale has as many pointers as there are colors chosen in the Palette.

Press on the arrow buttons at the top and bottom of the slider scales to change the value by one unit at a time.

The number windows at the bottom of each Slider Scales display the numerical setting of that Slider Scale. Press on the window and type in a new number, followed by the Enter key, to change the setting of that slider. In Multi-color mode, the number windows show whichever color has most recently been changed *on that slider.* So in Multicolor Mode, each number window can display the value for a different color.

To use the Color Sliders to change one color (Single-color Mode):

- **Turn off Multi-color, if not already off, and choose the color on the palette to be changed.**

- **Press on a slider scale and drag it to a new position.** The current color changes accordingly, in real time.
  Or:
  Press anywhere on the slider scale (without dragging). The pointer jumps to the new position and the current color changes accordingly.

With Multi-color mode on, you can change the Hue, Saturation, or Brightness of all the underlined colors simultaneously. Individual colors are indicated by pointers at the right of each slider and can be moved individually.

You can change all the colors simultaneously by dragging one of the blue end-pointers up or down the scale. This stretches or squeezes the entire range of chosen colors and they all change accordingly in the Palette. Or, you can change all the underlined colors simultaneously by pressing and dragging the yellow mid-point pointer. All the pointers move up and down together, without stretching or squeezing

If you drag one of the blue end-pointers till it touches the other one (collapsing the range of values) and then pull it away again (stretching the range of values), all the pointers between become equally spaced. Thus you can reset whole ranges of colors, manually creating blends.

Copying Colors in the Palette

To copy a color from one position on the palette to another:

- **In single color mode, press on the palette box you want to copy.**
- **Press the Copy Prefix Button.**
- **Press the palette box you want to copy the color to.** The source color is copied into the target palette box. The source palette box remains underlined.

This copy colors procedure works the same for a group of colors in Multiple Color Mode as for a single color.

Current Color Button

The large box above the green Color Mode button displays the color of the currently selected palette color. If the palette is in Multi Mode, the upper-leftmost palette color will be displayed.

Background Color Button

The box above the Current Color Display is the Background Color Button. It displays the color of the transparent background in the Canvas.

To change the color of the transparent background:

- **If Multiple Colors is on, turn it off**.
- **Press the box in the palette that you want to copy into the Background Color Button.**
- **Press the Background Color Button.** The underlined palette color is copied into the Background Color Button. After a momentary pause, the transparent background color in the Canvas changes to match the Background Color Button.

4.4 GRID AND DIRECTION FUNCTIONS

Figure 4-22. Grid Buttons in the Brush Display

The Grid and Direction Buttons are below the red Erase Buttons. They allow you to constrain various Canvas operations to grid points or to specific directions.

4.4.1 Grid Functions

Grid Button

The Grid function, when turned on, constrains many of Liberty's Paint functions to user-definable, invisible, evenly-spaced grid points. The positioning of all the Paint functions, including Line and Curve, Paint Mask, Rectangle Mask and the Paste functions are constrained by Grid.

Press the Grid Button to turn Grid Mode on. When turned on, Grid is set to the previous Grid values and the Grid Button is highlighted. If no previous Grid values have been set, the default is a full-screen grid; i.e., the entire screen is one big grid rectangle.

The grid may or may not be visible when on, depending on whether or not the “Show Grid” button is on.

Grid Popup

Figure 4-23. Grid Popup

Press the corner button of the Grid Button to call up the Grid Popup. You can enter numbers for the x and y dimensions of a grid, and for the x and y grid offsets. The offsets of the grid define where the grid starts on the screen. The offset numbers measure the distance from the lower left corner of the Canvas to the xy starting position of the grid. Or you can press the From Mask Button at the top of the Grid Popup and a grid will be created using the bounding box of the current masked area on the Canvas.

The From Mask Button

Press the From Mask Button to set a grid defined by the size of the bounding box of the current masked area on the Canvas.

The Pixels Button

When highlighted, the values in the four grid size and offset windows represent numbers of pixels.

The Inches Button

When highlighted, the numeric windows represent size and offset values in inches.

The Millimeter Button

When highlighted, the numeric windows represent size and offset values in millimeters (mm).

X-Size Window

The value in this window is the horizontal distance between grid lines

Y-Size Window

The value in this window is the vertical distance between grid lines.

X Offset Window

This value represents the horizontal offset or positioning of the first vertical line from the left edge of the canvas.

Y Offset Window

This value represents the vertical offset or position of the first horizontal line from the bottom edge of the canvas.

The Show Grid Button

Press the Show Grid Button on the Grid Popup to display grid intersection as white dots. These dots are not part of the picture and will not be saved to disk with the picture nor sent out to a video board for recording. Press the Show Grid Button again to turn it off (to make the grid invisible).

The Grid Division Buttons (div2 and div4)

Press one of these buttons to subdivide the current grid. The Div2 Button subdivides the grid by a factor of two, the Div4 Button by a factor of four. All functions constrained by Grid will now operate on the sub-grid intersections. Press the button again to turn it off.

The Grid Elevator

A four-level elevator is at the right side of the Grid Popup for storage of grid set-ups.

To create a grid from the current masked area on the Canvas:

- **Mask a rectangle on the Canvas the size and shape of a single grid rectangle.** Use the Rectangle Mask Button on the Mask Panel Menu, see page 4-57 for details.

- **Press the corner button of the Grid Button.** The Grid Popup appears.

- **Press the From Mask Button.** A grid is created based on the masked area. By default, the grid is invisible, but with the Show Grid Button you can make it visible.

When Grid is on, press the Grid Button again to turn Grid off. The next time you press the Grid Button to turn it on, the previous values are remembered and reset.

Mask Grid Button

On the Mask Tools 2 Panel is a button labeled Grid that, when pressed, creates a mask of one (1) pixel line width using the grid. The Mask Grid Button works (using the current Grid) whether the Grid Button is actually turned on or not.

To make the current grid a permanent part of the picture:

- **Set the desired grid using the Grid functions.**
- **Press the Mask Grid Button in the Mask Tools 2 Panel.** The current grid appears as one-pixel-wide masked lines.
- **Press the Apply Color Button (in the Image Tools 1 panel).** The current color (or colors) is applied into the masked grid lines. Then you can edge the one-pixel grid to make it thicker, work on it with the various functions of the Paint Environment, and/or save it to the disk.

4.4.2 Direction Functions

Direction Button

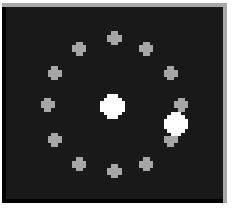

Figure 4-24. Direction Button

Located a bit below the Grid Button, the Direction Button looks like a clock with a white dot in the center to turn it on and off. A circle of smaller dots represents the numbers of the clock where the "hand" of the clock moves around, defining an angle, or direction. When the "hand" dot is at 3 o'clock, the direction is 0 degrees (or 360 degrees). When the hand is at 12 o'clock, the direction is 90 degrees. With Direction Mode on, many functions, listed below, are constrained to the current direction. The setting of the Direction Button is used for the linear Apply Color Button for creating multi-colored ramps, regardless of whether Direction is turned on or not.

To set a new Direction:

- **Press and drag the large white dot on the outer circle of dots, moving it around to set the direction.** The large dot moves in 15 degree increments. Or, when the cursor is over the Direction Button, you can type a number on the keyboard to set the direction to any number of degrees from 0 to 360. *The Direction Button does not have to be on to change its direction.*

When the Direction Button is on, you can turn it off by pressing the center dot again.

Horizontal / Vertical Mode Buttons (X and Y)

The two buttons above the Direction Button are the Horizontal and Vertical Mode Buttons. Turning on one of these restricts the functions listed below to horizontal or vertical operation.

Functions that are constrained by the Grid, Direction, Horizontal, and Vertical Modes:

- **Paint**
- **Line**

- **Paint Mask**
- **Rectangle Mask, Square Mask, Gradated Rectangle Mask,Gradated Square Mask**
- **Add, Move Curve Points**
- **Paste, Paste Mask**
- **Tile**
- **Text positioning functions**

4.5 PREFIX BUTTONS

Figure 4-25. Prefix Buttons

The Prefix Buttons are located under the Palette/ Buffers Panels halfway down the Paint Environment. A Prefix Button modifies functions pressed immediately after it. The Prefix Buttons include Repeat, Under, Add, Copy, and Invert.

The Prefix Buttons turn off automatically when the function is completed. You can turn them off manually by pressing them a second time.

Depending on the prefix, it is possible to have multiple prefix buttons activated simultaneously.

Repeat Prefix Button

Most Liberty functions automatically terminate after a single use. The Repeat Prefix keeps a function active for multiple uses. To use the Repeat Prefix, press on the Repeat Button, then press the function button you want to use in Repeat Mode. Press the

function's Cancel or OK Button to terminate the function. You can press the active (high-lighted) Repeat Button to turn it off while using the function. For example, for repeated recalls from the disk, press the Repeat Prefix, then the Recall Button (for information on recalling files see page 4-21). The File Popup stays up during as many recalls as you like. Press the Cancel Button on the File Popup to terminate, or just before the last Recall, press the Repeat Prefix again to turn it off. After you recall another file, the File Popup disappears and the function terminates because the Repeat Prefix is no longer on. Another way to terminate a function that you are using with Repeat is to press the highlighted function button a second time to turn it off. Then don't forget to also press the highlighted Repeat Button to turn it off.

Under Prefix Button

The Under Prefix causes functions that put color or image into the picture to put the color or image under what is currently in the picture. A picture must have some transparency so that what is put "under" it can be seen. To use the Under Prefix, press the Under Button and then press the function you want to operate in Under Mode. Use the function. You can press the active Under Prefix to turn it off while using the function.

Add Prefix Button

The Add Prefix causes a function to add its result to another. Mostly used with elevator levels - for example, one temporary buffer can be added to another.

To add an elevator level (or other item) to another:

- **Press the source elevator box (or other item) to be added.**
- **Press the Add Prefix Button.**
- **Press the elevator box (or other item) to be added to.** The Add takes place. For instance, one Temp elevator level is pasted on top of another.

You can also press Add, then Recall, to recall a picture from disk on top of the current Canvas picture, rather than the screen being automatically erased first.

Copy Prefix Button

The Copy Prefix copies one item to another. It is often used to copy one elevator level to another, or one palette color box to another. Its second function is In-place; for instance, pressing the Copy Prefix, then pressing the Paste Button pastes the element into its original position on-screen rather than requiring manual placement. See ***§4.9.5*** for more details on the Paste function.

To copy one item to another:

- **Press the source item to be copied** *(elevator box, palette box, etc.).*
- **Press the Copy Prefix Button.**
- **Press the target item to be copied to.** The source is copied to the target.

Invert Prefix Button

The Invert Prefix Button inverts an operation. The following is a list of the functions it modifies with descriptions of how it affects them.

- **Invert Prefix plus Paint -** *paints under.*
- **Invert Prefix plus any masks -** *de-masks instead of masking.*
- **Invert Prefix plus Line/Curve Draw with multiple colors -** *inverts the order of the colors used.*
- **Invert Prefix plus Reveal Color, Luminance, or Hue (Image Tools 1 Panel) -** *Reveals from Canvas into Temp, instead of the other way around.*

4.6 MAGNIFY FUNCTIONS

Figure 4-26. Magnify Buttons

The Magnify functions allow you to zoom into the Canvas for close-up work. You can pan around the screen with the cursor or use the Canvas Buffer in the Buffers Panel to pan more quickly. The Full Button does the opposite of Magnify - it shows the entire Canvas, no matter what the resolution is. The six Magnify Buttons are at the bottom right of the Paint Environment Menu, below the Panel Menus. They are, from left to right:

Canvas - Magnify - Full - Set - In - Out

Canvas Button

Press the Canvas Button to cause the Canvas to fill the entire screen, replacing the menus. Press the "Menus" button to restore the Canvas and the menus to their normal display. If the Canvas is magnified when you press the Canvas Button, the magnified picture will fill the entire screen, replacing the menus. (The F8 keyboard key serves the same purpose as the Canvas/Menus button.)

NOTE

When you press the Canvas Button, it automatically zooms the Canvas image so that it fills the screen. The exceptions to this are (1) If you've already zoomed when you press Canvas, your current magnification is preserved, and (2) If the image is too big to fit into the standard Canvas screen no zoom is performed.

Magnify Mode Button

Press to turn on or turn off Magnification Mode. If you press it when the Canvas is not magnified, the previous level of magnification is restored, centered on the center of the screen. If you press it when the Canvas is magnified, the magnification is turned off. When Magnification is off, the Magnify Button is a quick way to return to the previous magnification. When Magnification is on, the Magnify Button is a quick way to turn it off.

Full Button

Press the Full Button to turn it on/off. The Canvas display scales to fit inside the Canvas window, regardless of resolution.

Use Full-page Mode for resolutions that are larger than the available picture area. All Paint functions work in this mode.

NOTE

If the resolution of a stored image recalled into the Canvas is larger than the Canvas resolution, pressing the Full button will only display the maximum canvas resolution, not the larger image resolution. The recalled image is truncated to the configured canvas resolution.

Set Magnify Button

The Set Button is the easiest way to magnify the Canvas. Press it to turn it on/off. While it is on, each time you press on the Canvas the magnification increases one level.

To use the Set Magnify Button:

- **Press to turn on.**
- **Press on the position on the Canvas where you want to center the magnified image.** Each time you press, the Canvas is magnified by a factor of 2 (2X, 4X, 8X, etc.) up to 32X (16X on some platforms), centering where you press. When you have magnified the picture, you can pan around it by turning on the CanvDrag button and pressing/dragging the Canvas. You can also use the Canvas Buffer in the Buffers Panel at the left of the Canvas to pan around in a magnified picture. Thus you can quickly pan around a magnified picture while, for instance, simultaneously painting on it.
- **Press Set Magnify again to turn it off.**

Zoom In Button

The Zoom In Button is a quick way to magnify, but without much control of where the magnified picture centers.

Press to increase the current magnification by 2X. The center of the displayed picture remains constant. If bound to a keyboard key (see the Macro Panel Menu, page 4-68), pressing the key centers the displayed picture around the current pen position on the Canvas. If the picture is not magnified when you press the Zoom In Button, magnification centers on the center of the screen. If in Full-page Mode, when normal magnification is reached Full-page Mode is automatically turned off.

Zoom Out Button

The Zoom Out Button is a quick way to de-magnify one level.

Press to decrease the current magnification by 2X. The center of the displayed picture remains constant, unless the center is too close to the edge of the picture, in which case the center moves so as to not display an area outside the Canvas.

CanvDrag Button

Press the CanvDrag Button to turn it on and enable panning on the Canvas image. When the canvas is magnified and CanvDrag is on, you can press anywhere in the Canvas image and drag it around.

Panning with the Alt Key

Pressing the Alt key on the keyboard has the same effect as turning CanvDrag on and can be much more convenient. The CanvDrag Button highlights

when the Alt key is held down. The user can then press anywhere in the magnified Canvas image and drag it around, for as long as the Alt key is pressed.

Pressing on any of the Canvas borders now pans the Canvas one pixel per click in the corresponding direction.

4.7 CALCULATOR

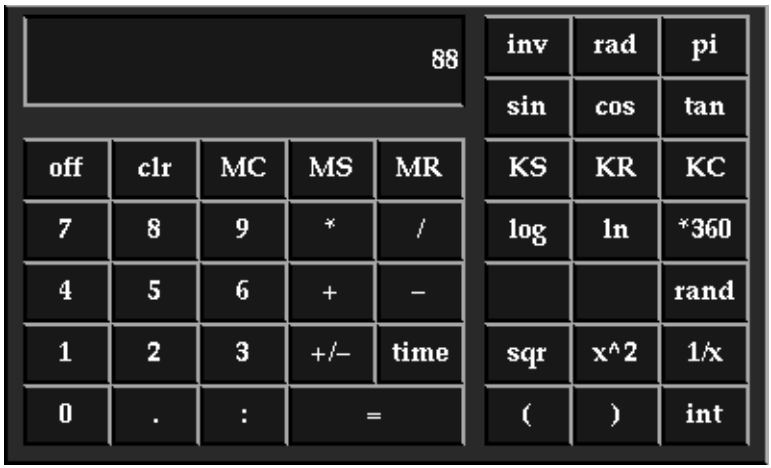

Figure 4-27. Calculator

Liberty's calculator works like a typical pocket calculator. You use it to help compute values where arithmetic is involved.

There are two ways to bring the calculator up:

- **When you are using a function that puts a numeric value in the Prompt Window, press on the Prompt Window itself.**

- **Just after keying a value into a number window, press on the Prompt Window.** The value you just entered into the number window appears

in the Calculator. Perform your calculation, and when you press the Off Button the value in the calculator is entered into the number window.

In each of these cases, the calculator begins with the number from the corresponding input button. You can then use the calculator to compute a new value. Remove the calculator by pressing the Off Button. The number in the Prompt Window takes the number from the numeric display window of the calculator, updating the current function if a change has been made.

If you press the "Off" Button before changing the value, the calculator disappears and puts its value back in the corresponding input button.

The calculator has two panels, one of which is hidden by default. To enable/disable the second panel, press on the calculator above the numeric display window. Functions of the second panel are described below.

The main panel has a numeric display window, and buttons for Off, Clear, Memory Clear, Save, Restore, Numeric Entry, Basic Arithmetic (+, -, *, /), Equals (=), and Timecode Mode (time).

The numeric display window displays the current number being entered, or the current cumulative result of an operation.

Just like a pocket calculator, Liberty's calculator has precedence rules. Divide and Multiply have higher precedence than Add and Subtract. This means that the evaluation of Adds and Subtracts is delayed until another Add or Subtract is specified, or until you press the "=" Button.

There are parentheses buttons in the second calculator panel to override the above precedence rules. Multiple levels of nested parentheses are allowed. The left Paren Button is highlighted as long as a left parentheses is active (until all left parens have corresponding right ones).

The Clear (clr) Button clears the calculator so that you can start a fresh computation, setting the numeric display window to 0. Neither the calculator's memory nor constants are cleared.

The Memory Buttons allow you to save a value in the calculator's memory for later use. The "MC" Button zeros the memory; the "MS" Button stores the current number from the numeric display window; and the "MR" Button recalls the last saved value for use (equivalent to entering the number using the Numeric Menu Buttons, but faster).

Numeric Entry Buttons include the digits 0 - 9, a decimal point (".") for entering fractions and a Timecode Separator (":") for working with timecode. The ":" Button shifts the timecode in the display window left 2 digits.

The Time Button turns Timecode Mode on and off. In Timecode Mode numbers are displayed in hours, minutes, seconds, and frames (thirtieths of seconds.

If you make an illegal operation, like taking the square root of a negative number, "Error" appears in the display window. Clear by pressing the Clear Button or entering another number.

The second calculator panel contains a number of more complex functions, including:

inv - modifies the next sin, cos, tan, log, or ln operation to invert it, resulting in arc-sin, arc-cos, arc-tan, power of 10, or power of 'e', respectively. It highlights until the operation is performed, then turns off.

rad - mode button - interpret the number as radians when on, otherwise interpret it as degrees (used by sin, cos, and tan). The button is highlighted when in Radians Mode.

pi - enters the trigonometric constant pi (3.1415962...)

sin - takes the trigonometric sine of the number in the display window.

cos - takes the trigonometric cosine of the number in the display window.

tan - takes the trigonometric tangent of the number in the display window.

KS, KR, KC - store, recall, clear one of the 10 numeric constants. These are similar to MS, MR, MC in the first panel, but allows you to save and recall multiple values.

KC - zeros all 10 constants

KS - pressing KS followed by a digit, i (0-9), stores the number from the display window as constant number i.

Pressing KS followed by an operation (+, -, *, /) followed by a digit, i (0-9), takes constant number i and the current number from the display window, performs the specified operation, and replace constant number i with the result.

KR - pressing KR followed by a digit, i (0-9), recalls constant number i.

log - takes the logarithm (base 10) of the number.

ln - takes the natural logarithm (base e) of the number.

***360** - multiplies the number by 360.

rand - generates a random number between 0 and 2**31 - 1.

sqr - takes the square root of the number.

x^2 - squares the number.

l/x - inverts the number

int - truncates the fraction of a decimal number.

The calculator has numeric entry keys as well, so you can use the keyboard. When the calculator is up, use the following keys for:

0 - 9 - enters the corresponding digit

. - enters a decimal point

m - recall number from memory

M - store number in memory

: - same as : button on calculator menu

$ - enable/disable timecode mode

! - clear

C - clear memory

(- enter left paren

) - enter right paren

= - same as = on calculator

enter - same as = on calculator

space - same as = on calculator

NOTE

When entering timecode in the Animation Environment, this is equal to a : . This is not true of the calculator.

| - change sign of number in display window

+, -, *, / - enter arithmetic operator

% - same as "int" Button on calculator

^ - square

- square root

i - inv

s - sin

c - cos

t - tan

l - log 10

r - rand

@ - clear constants

k - recall constants

K - store constant

R - int

4.8 BUFFERS PANEL

Figure 4-28. Buffers Panel

The Buffers Panel alternates with the Palette Panel, taking up most of the left side of the Paint Environment. It contains three Buffers - one at the top displaying a thumbnail view of the current Mask Buffer - one in the middle displaying a thumbnail view of the current "Temp," or Temporary Buffer, which is used for cutting, pasting, and distorting - and one at the bottom of the Panel displaying a thumbnail view of the current Canvas with a wireframe "handle" for panning around the magnified Canvas.

The Mask Buffer

Figure 4-29. The Mask Buffer

The Mask Buffers are places where you can store Liberty's masks. In Liberty you isolate an area of the picture to perform an operation on it by creating a mask of the area. You can paint a mask, create a mask from the luminance of the picture, make rectangle masks - there are many, many ways to make masks. The panel menu at the far right of the screen below the Canvas is the Mask Panel, where all the masking tools are found. These tools are described in detail in the chapter on the Mask Tools panel (page 4-363).

The Mask Buffer has its own blue Undo (U) and Redo (R) Buttons.

Mask Elevator

The Mask Elevator is the vertical slider scale at the right of the Mask Buffer marked by a stack of tick-marks that show how many Masks are configured (the default is six). Each tick represents a buffer that stores a mask without needing a filename assigned to it, as it would if it was being stored on disk. You can configure as many masks as you want in the elevator. Press on an elevator tick to display its contents in the Mask Buffer, making it the current elevator level. Up to 24 tick-marks can appear in the slider. If more than 24 masks are configured, no tick-marks appear in the slider.

The ticks are color-coded to indicate which are disk masks, which are RAM masks (see below), and which is the current mask (the one displayed in the Mask Buffer).

To copy a mask from one level to another:

- 1. **Press on the level of the Mask Elevator you want to copy from.** The mask in that level becomes active on the Canvas.
- 2. Press the Copy Prefix Button.
- 3. **Press the level of the Mask Elevator you want to copy to.** The mask from the source level is copied to the target level.

To add a mask from one level to a mask in another, repeat the above procedure, substituting the Add Prefix for the Copy Prefix. Only works with RAM masks.

If you use the Invert prefix with the Copy or Add prefixes, the source level values will be inverted before they are copied or added.

Mask Browse Popup

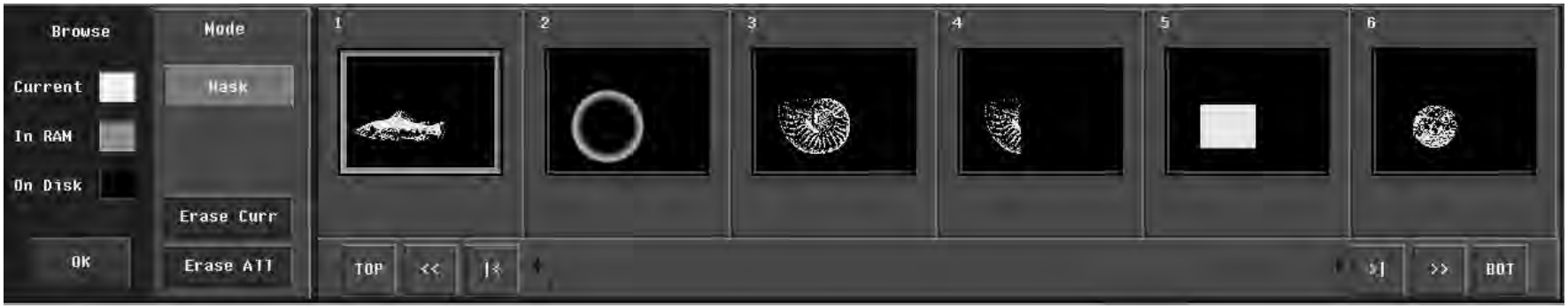

Figure 4-30. The Mask Browse Popup

Pressing directly on the Mask Buffer (the mask thumbnail) recalls this popup. It allows you to browse all six (or more) masks and manipulate them. Colored borders around the browse images show which mask is current, which masks are in RAM, and which are on disk. There is a color key on the left side of the popup identifying the border colors. You can change these colors by underlining a color in the palette and then pressing on the border color box you want to change.

Mask Browse Slider

The Mask Browse Popup displays six mask browse images at a time. Each mask browse image is numbered at the upper left of the browse image. Use the slider at the bottom of the popup to scroll through the available mask browse images, assuming that more than six masks are configured. When the slider is all way to the left, the first six masks are displayed. Moving the slider to the right scrolls through the rest of the masks.

Top Button

Press to display the first six masks.

Scroll Left Button (<<)

Press to scroll the masks left by six levels.

Jump Left Button (|<)

Press to jump the masks left by one level.

Jump Right Button (>|)

Press to jump the masks right by one level.

Scroll Right Button (>>)

Press to scroll the masks right by six levels.

Bottom Button (Bot)

Press to display the last six masks.

As with all Liberty elevators, you can copy the Masks in this popup from one browse image to another by pressing one browse image, then the Copy Prefix Button, and then the browse image you want to copy to.

Note that when browsing masks in the Mask Browse popup, some of the browse images may appear as all red. This represents a Mask buffer on disk which is currently empty.

Fast Masks

Depending on how much memory you have on your hardware platform, you can configure some of the levels of the Mask Elevator as Fast Masks to be stored in RAM for almost instantaneous save/recall. There must always be at least one Fast Temp. To change the number of Fast Masks, see ***page 3-30*** in the Configuration Environment section.

To Compute How Much RAM You Need for Fast Masks

The number of bytes of RAM required for each Fast Mask is easily computed, using the following formula (divide by 1024 to convert to KB; divide by 1024 again to convert to MB):

bytes = 4 *times* Canvas x resolution *times* Canvas y resolution for Liberty 32

bytes = 8 *times* Canvas x resolution *times* Canvas y resolution for Liberty 64

Mask Display Buttons

Use Mask Button

The top button next to the mask thumbnail (labeled "Mask") is highlighted when a mask is active on the Canvas. When it's not highlighted, press it to make the current mask active.

A masked area is normally displayed on the Canvas by a transparent color superimposed over the Canvas; the default mask color is transparent red. The buttons at the right of the Mask Elevator provide choices about the masks are displayed. The top button, labeled "Mask," is highlighted when a mask is active on the Canvas.

Mask Only Mode (Only)

Press the Mask Only Button to display the mask as white on black. White indicates the presence of mask; black indicates no mask. No other picture elements are displayed, so you see the mask alone. This mode is useful for previewing luminance or chrominance masks while adjusting them

Transparent Mask Mode (Tran)

Press the Transparent Mask Button to display the background color through the masked area of the Canvas. Thus the masked area is displayed as transparency, not as a separate color.

Opaque Mask Mode (Opaq)

Press the Opaque Mask Button to display the masked area opaquely in the current display color.

Mixed Transparency Mask Mode (Mix)

Press the main part of the Mix Button (not the window) to transparently display the masked area in the current display color.

Mix Popup

Figure 4-31. Mix Popup

Press the color window of the Mix Button to call up the Mix Popup. There must be an active mask on the Canvas (the Use Mask Button must be highlighted). The color window also shows the current color used to display masks. The Mix Popup contains a slider scale for setting the level of transparency of the mask display (0 - 255) - about 128 (equivalent to about 50% transparency) is a good setting. You can set the mask color by pressing the color box in the Mix Popup.

To change the mask color:

- 1. **Press the color window in the Mix Button.** The Mix Popup and the Palette appear.

- 2. Underline the palette box of the color you want to use for displaying masks.
- 3. **Press the color window in the Mix Popup.** The color widow changes color, and all the masks will be displayed in the new color.
- 4. **Press the OK Button**. The popup disappears. The color window in the Mix Button now displays the new mask display color.

Transfer Buffer

Figure 4-32. The Transfer Buffer

The Transfer Buffer is a temporary storage buffer (Temp) used for holding images that are to be pasted back into the Canvas in various ways, or just as a convenient place to store an image temporarily (without saving it more permanently to disk). There are six default levels of Temps in the Temp Elevator at the right of the Transfer Buffer, and you can configure as many Temps as you want. You can "cut" the Canvas into a Temp or recall a picture directly from the disk into a Temp. All Cut and Paste functions happen to and from a Temp. The Transfer Buffer shows a thumbnail image of the contents of the currently active Temp.

The Transfer Buffer has its own blue Undo (U) and Redo (R) Buttons.

Temp Elevator

The Temp Elevator is the vertical slider scale at the right of the Transfer Buffer marked by a stack of tick-marks that show how many Temps are configured (the default is six). Each tick represents a Temp that can store or recall a picture without needing a filename assigned to it, as it would if it was being stored on disk. Press on an elevator tick to display its contents in the Transfer Buffer, making it the active elevator level. Up to 24 tick-marks can appear in the slider. If more than 24 Temps are configured, no tick-marks appear in the slider (but the slider functions the same as if the tick marks were visible.)

The ticks are color-coded to indicate which are disk Temps, which are RAM Temps (see below), which is the current Temp (the one displayed in the Transfer Buffer window), and which Temps are active as layers (turned on in the Layers Popup - see below. Note that the current Temp, plus any active layers, are always in RAM).

Global Temp Elevator

Figure 4-33. The Global Temp Elevator

There is also a Global Temp Elevator in the lower right part of the Paint Environment, just above the Magnification Buttons. It is horizontal rather than vertical and the ticks are not color-coded. Pressing on a tick in the Global Temp Elevator turns that Temp on or off. It's useful when the Buffers Panel is not visible because the Palette has replaced it.

The Global Temp Elevator has two modes. Press on the word "Layers" to toggle between them. One shows only RAM Temps; the other shows all configured Temps.

Save to Temp Button (the < button)

Press to save the contents of the Canvas into the current Temp. Saves the entire Canvas whether or not a mask is active. To save only the masked area to a Temp, use the Cut Button in the Transfer Panel Menu below.

Swap with Temp Button (the < > button)

Press to swap the contents of the Canvas with the contents of the current Temp. The Canvas picture appears in the Temp Window and the contents of the Temp appear in the Canvas. Swaps the entire Canvas whether or not a mask is active.

Recall from Temp Button (the > button)

Press to recall the contents of the Temp into the Canvas. The current contents of the Canvas are first erased.

Layers Button

The Layers Button is a mode button that allows you to turn on/off Layers Mode, which displays one or more of the Temps as layers over the Canvas.

Press the Layers Button to turn it on. The button is highlighted and the contents of the active Temp layers are displayed over the Canvas. When you press the Layers Button again to turn it off, the layered Temp images disappear from the Canvas.

Layers

In this document the terms “Temps,” “Temp Buffers,” and “layers” are used more or less interchangeably. There is a subtle difference between Temps and layers, however, in that only Fast Temps (Temps stored in RAM) can be active layers. Provided you have enough RAM on your hardware platform, it may be convenient for you to put all of your Temps into RAM.

Liberty allows you to configure a number of Temps as active layers, which can be simultaneously overlaid over (or under) the Canvas. Pressing and dragging a layers image on the Canvas moves the image to a new position. Then, when all the layers are positioned to your satisfaction, you call up the Layers Popup and press the Composite Button to paste the layers onto the Canvas for a final composited image.

In the Layers Popup you can change the transparency of the layers, change their relative priority in the stack, perform Paint and Tools operations on them, and distort them using Paste Distort - all while the layers are being temporarily displayed on the Canvas. These modifications become permanent only when you give the Composite command, at which time the layers are composited onto the Canvas.

Fast Temps

Depending on how much memory is on your hardware platform, you can configure some of your Temps as Fast Temps to be stored in RAM. The default is one Fast Temp. Only Fast Temps (RAM Temps) can be accessed as active layers as described above. There must always be at least one Fast Temp. ***To change the number of Fast Temps, see page 3-29 in the Configuration Environment section.***

The current Temp is always stored in RAM. Thus, when you click on a disk Temp (one not in RAM), making it the current Temp, it becomes a RAM Temp, and the previous current Temp becomes a disk Temp, preserving the same number of Temps in RAM.

Unlimited Number of Layers

The default number of Temps is six, but you can configure as many Temps as you want, depending on available space, and any number of them can be Fast Temps, depending on available RAM.

Temp Layers Resolution

Liberty's Temp Buffers have variable resolution, based on the size of the image that is in the Temp. Thus, in RAM Temps small images consume less RAM than large images. If you use your layers primarily for small cutouts, you may be able to configure many more Temps in RAM.

Temp Buffers can also be larger than the Canvas. Thus you can load an image that is larger than the Canvas into a Temp, then modify it with, for example, Paste Distort, without having to go into a larger Canvas resolution.

Layers Popup

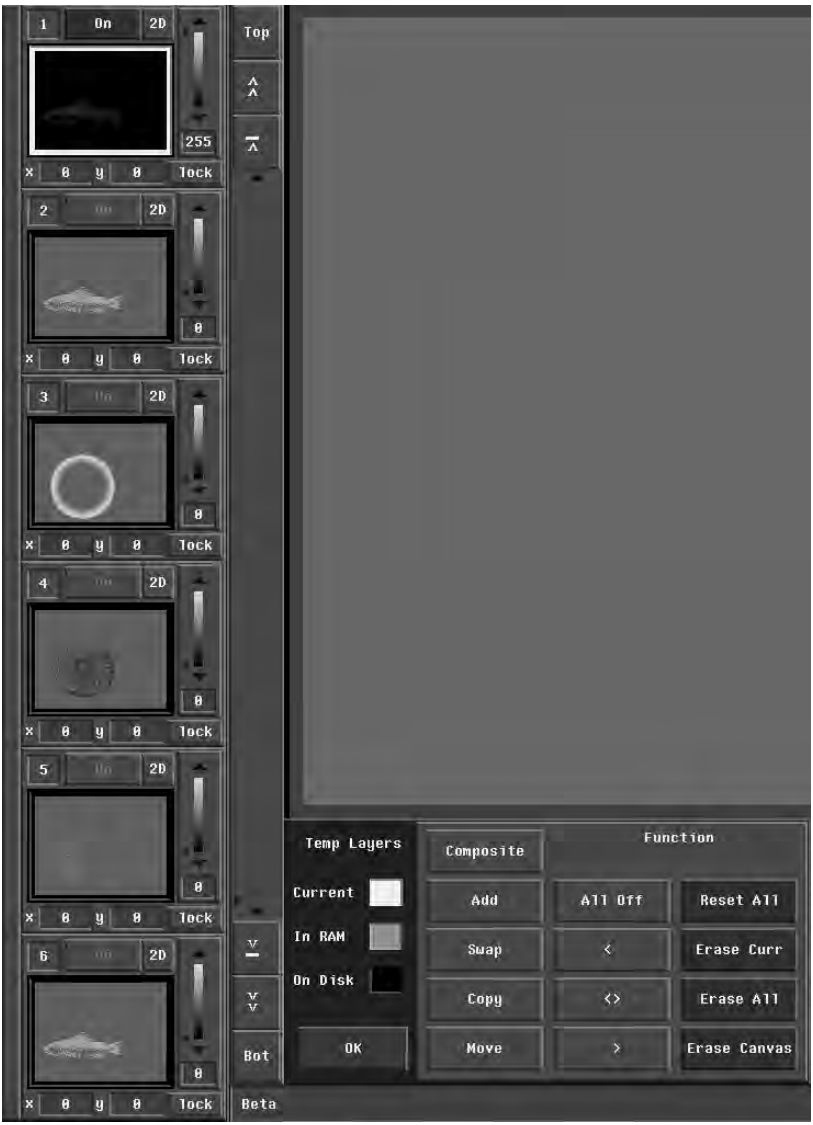

Figure 4-34. The Layers Popup

Press directly on the Transfer Buffer (thumbnail) in the Buffers Panel to display the Layers Popup.

The Layers Popup displays the Temp layers as small browse images and provides many controls to modify the layers, including positioning, transparency, Paste Distort, and the relative position of layers in the stack.

The Layers Popup displays six browse images at a time and, if more than six layers are configured, allows you to scroll up and down the stack of layers. At the upper left of each browse image is its number, starting with 1 as the top layer.

Layer Priority

Prioritization of the layers is from top to bottom, with Temp 1 having the highest priority (top layer) and the lowest Temp in the stack having the lowest priority (bottom layer).

Canvas Position Relative to Layers Stack

At the left of the Temp browse images is a vertical bar that controls the position of the Canvas relative to the layers. A white marker on the bar denotes the position of the Canvas relative to the stack. Pressing on the bar moves the Canvas up or down the stack. For example, pressing on the bar between the first and second layers displays the Canvas under the first (top) layer but above all the other layers.

Layers Browse Slider

When more than six layers are configured, use the vertical slider at the right of the browse images to scroll through the available layers. When the slider is all way at the top, the first six layers are displayed. Moving the slider down scrolls through the rest of the layers. When the slider is all way at the bottom, the last six layers are displayed.

Top Button

Press to display the first six layers.

Scroll Up Button

Press to scroll the layers up by six levels.

Jump Up Button

Press to jump the layers up by one level.

Jump Down Button

Press to jump the layers down by one level.

Scroll Down Button

Press to scroll the layers down by six levels.

Bottom Button

Press to display the last six layers.

As with all Liberty elevators, you can copy the layers in this popup from one level to another by pressing a thumbnail, then the Copy Prefix Button, and then the thumbnail you want to copy to.

Note that when browsing temps in the Layers popup, some of the browse images may appear as all red. This represents a Temp buffer on disk which is currently empty

Individual Layer Controls

You can modify each layer individually using buttons near each layer's browse image, including On/Off, X and Y position, 2D and 3D Paste tools, a Lock Button, and an alpha slider. The layer must be active (in RAM) for these tools to be used.

On Button

Press a layer's On Button to make that layer actively overlaid on the Canvas. The On Button becomes highlighted and the contents of the layer appears overlaid on the Canvas.

Transparency Slider

Controls the individual layer's transparency. As you move the slider, the preview of the layer's transparency changes on the Canvas. You can press in the numeric window to type in a transparency value.

X and Y Position Windows

These windows display the numeric X and Y values for each layer. You can press in the numeric windows to type in a new X or Y value. Also, when the layer is active, you can click above or below the X or Y labels to move the image one pixel at a time for incremental adjustments.

Lock Button

Press to turn it on (it becomes highlighted) to lock the layer in its current position in order to prevent accidental movement. Press again to unlock it. Note that when Lock is on, you can still change the layer's position using the layer's X and Y windows.

2D/3D Button

This button is labeled "2D" by default. (When the layer is in 3D Paste mode, described below, the button is labeled "3D").

2D Paste Popup

Figure 4-35. Paste Normal Popup

Press on the 2D Button to display the 2D Paste Popup for that individual layer. The 2D Paste Popup increases your control of XY positioning by making the Adjust tools available, as well as the keys in the numeric keypad on the keyboard for incremental

adjustments. Also available are the Center and In-place Buttons. Press the OK Button to exit the 2D Paste Popup.

NOTE

The X, Y settings in the 2D popup refer to the center of the image, not the lower left corner.

3D Paste Popup (Paste Distort)

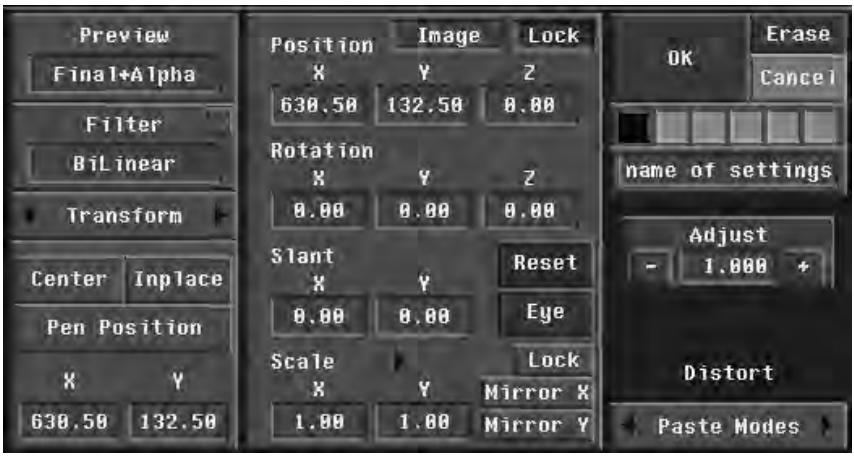

Figure 4-36. The 3D Paste Popup

To go into 3D mode from the 2D Popup, press on either end of the Paste Modes Button in the 2D Paste Popup. The 2D Paste Popup is replaced by the Paste Distort Popup. You can now use all of the distort and warp tools on the popup, and the result is updated in the Canvas overlay of the individual layer.

Press the OK Button to exit the Paste Distort Popup. When you exit Paste Distort in this way, the layer remains in 3D mode (the 2D Button now is labeled "3D") and the layer is displayed on the Canvas in its

"distorted" form and can be dragged around in X and Y (when re-positioning a 3D layer, its wire-frame appears momentarily). You can display the Paste Distort Popup at any time by pressing on the 3D Button.

To return from the Paste Distort Popup to the 2D Paste Popup, do not press the OK Button, but rather press the Paste Modes toggle button, and the 2D Paste Popup reappears.

A Note on Hardware Platforms

There is no limit to how many layers can be 3D. On newer hardware platforms with texture mapping, previews of the 3D layers are performed in highly interactive real-time. If there are too many 3D layers to fit in texture memory, or if the user is running on an older system, 3D layers will be displayed in soft-ware. In this case, the preview will not refresh while the layer's position and/or 3D attributes are being changed. In this case the preview will refresh as soon as the user releases the pen/mouse.

Using Paint, Image Tools, and Mask Tools with Layers

You can paint and apply Image Tools to individual layers (when the layer is in 2D Mode only). Also, you can use individual layers as source images for a number of Mask Tools (such as Channel Lumi-nance).

Painting to Layers

At the top of the Paint Panel is a bar where you can chose different Paint Modes - On Canvas for normal painting on the Canvas, On Temp for painting to the current layer, and On Mask for painting into masks.

When Paint On Temp Mode is active, all paint functions apply to the current Temp layer, and only works if the current Temp is an active layer (that is, if it is displayed as a layer on the Canvas). Paint functions that need the current Temp as a source image, such as Reveal Paint, are disabled.

When Paint is off, pressing on a layer on the Canvas makes that layer the current layer. This is a quick way to select a layer for Painting or for applying Image Tools.

Applying Image Tools to Layers

The Image Tools Panels have a Canvas/Temp Mode bar on the top, similar to the Paint Panel. In Canvas Mode, the Image Tools apply to the Canvas. In Temp Mode, they apply to the current Temp (the Temp must be an active layer). Thus, you can apply Image Tools and their previews to various individual layers on the Canvas by selecting a layer as the current layer, then applying the function as desired. Note that several Image Tools are not implemented for Temp Mode. This is generally because such tools require both the current Temp and the Canvas. The following Image Tools are not implemented in Temp Mode: Reveal, both Morph functions, Motion Tracking, Dither, and Chroma Keying. These buttons are grayed out when Temp Mode is active.

Layers as Source for Mask Tools

The Mask Panel also has a Canvas/Temp Mode bar at the top. Mask Tools that in Canvas Mode use the Canvas as their source (such as Alpha, Channel, Fill, and Match) use the current Temp as their source when Temp Mode is active. For example, if you toggle to Temp Mode, you can use Channels/Luminance Mask to generate a mask from the luminance of the current Temp.

When the current Temp is not enabled as a layer, the mask is generated from the in-place position of the current Temp. When the current Temp is an active layer, the layer offset is used to generate the mask. This is true for Alpha, Channel, Match, Diff and Paste Mask (Fill Mask requires that the layer be active).

Layers Function Buttons

Composite Button

Press to paste all active layers onto the Canvas, in their currently previewed form.

Add Button

The Add Button allows you to add the contents of one Temp over another.

To add one layer over another:

- 1. **Press the Temp to be added.** Its border is highlighted.
- 2. **Press the Add Button.**
- 3. **Press the Temp to be added over.** The image in the first Temp is added over the second Temp.

Swap Button

The Swap Button allows you to exchange the priorities of two layers.

To Swap two layers:

- 1. **Press the first Temp browse image to be swapped.** Its border is highlighted.
- 2. Press the Swap Button.

- 3. **Press the second Temp to be swapped.** The images in the two Temps are exchanged.

Copy Button

The Copy Button allows you to copy the contents of one Temp into another.

To copy one layer into another:

- 1. **Press the Temp to be copied.** Its border is highlighted.
- 2. Press the Copy Button.
- 3. **Press the Temp to be copied into.** The image in the first Temp is copied into the second Temp.

Move Button

The Move Button allows you to move the contents of one Temp into another.

To move one layer into another:

- 1. **Press the Temp to be moved.** Its border is highlighted.
- 2. Press the Move Button.
- 3. **Press the Temp to be moved into.** The image is moved into the target Temp. The image already in the target Temp is moved up or down one level, so that the effect is that the moved Temp image is inserted into the stack just below the target Temp. The previewed layers on the Canvas are updated appropriately.

All Off Button

Press to turn all layers off. This changes nothing other than making all layers non-active.

Reset All Button

Press to reset the attributes of all layers to default settings. All Temps are set to 100% opacity and their original XY positions.

Erase Current Temp Button (Erase Curr)

Press to delete the contents of the current Temp layer only (you are first prompted).

Erase All Button

Press to delete the contents of all layers (you are first prompted).

Erase Canvas Button

Press to delete the contents of the Canvas (you are first prompted).

Temp Layers Color Codes

Each Temp browse image has a colored border denoting what state it's in: Current, RAM, or Disk. Three windows display the color codes for these states and allow you to change the assigned colors.

The "Current" window (default yellow) shows the border color used to denote the current Temp layer.

The "In RAM" window (default light blue) shows the border color used to denote which Temps are stored in RAM (active layers).

The "On Disk" window (default dark blue) shows the border color used to denote which Temps are stored on Disk (inactive layers).

To change the coded colors:

- 1. **Press the window of the color to be changed.** The color palette appears.
- 2. Choose and modify a palette color.
- 3. **Press the OK Button beneath the palette.** The palette disappears and the color window is changed to the new color, updating the appropriate layer borders.

Loading Layers Graphically

The most convenient way to load a number of Temp Buffers with images from the disk is to graphically load them from the Full-Screen File Menu.

To load layers graphically:

- 1. **Press the File Manager Button on the Transfer Panel.** The Full-Screen File Menu appears.
- 2. **Press the right end of the pink Canvas File Mode Button to change it to Temp.** The Temp Loader appears across the bottom of the screen.
- 3. **Press on the browse image you want to load into a Temp.** It becomes highlighted.
- 4. **Press on the Temp browse window you want to load into**. The chosen browse image appears in the indicated Temp browse window.
- 5. Repeat for as many pictures as you want.
- 6. **Press Cancel to remove the Full-Screen File Menu.** Pressing OK also loads the last browse image into the current Temp.

Loading masks graphically works in a similar fashion except that in Step 2 you switch the colored File Type Button to "Mask".

Figure 4-37. Full-Screen File Manager (w/ Temp Loader)

Saving Layers in the Layers File Format

You can save all layers as part of a single disk file. When you recall the file, each individual layer is recalled into its corresponding position in the stack along with all its attributes in their saved state.

The Layers File Format saves the images in all active layers as well as their individual layer settings (including position, alpha, etc.) in one file on disk. The Canvas is saved in the file as well. Thus you can save the composition you are working on and come back to it later without finalizing the settings of the layers. When the Layers File is recalled, the Canvas and all layers and settings are restored from the disk. Also, when layers are recalled from disk the levels into which they are loaded are turned on even if they were off prior to the recall. Note that if there are currently fewer RAM Temps than there are layers in the recalled file, only the layers loading into current RAM Temps are recalled. (This only happens if you've reduced the number of RAM Temps since saving the Layers File.)

The Layers Mode Button is a cyan-colored button in the File Mode Popup. You call up the File Mode Popup by pressing on the colored File Mode Button (pink "Canvas" by default) directly above the file path elevator in the Recall and Save Popups. You can also toggle through the file modes by pressing on the left or right edges of the File Mode Button. There are similar controls in the Full-Screen File Manager Menu as well.

Once you've selected the Layers mode as described above, using the Save Button saves the Canvas and any active layers to a Layers File. Using the Recall File Button while in Layers Mode displays any Layers Files in the directory, while you can browse Lay-

ers Files in the Full-Screen File Manager Menu. Pressing on a Layers File in the Recall Popup or Full-Screen File Manager Menu recalls the Canvas and layers from the disk.

Save Inactive Layers Button

By default only active layers in RAM are saved in a Layers File. As an option, you can save the inactive layers (in addition to those turned on) in a Layers File. You control this with the Save Inactive Layers Button in the Save Pop-up (accessed through the corner button of Save in the Transfer Panel). Press on this button to turn it on (it becomes highlighted). As long as it is on, inactive layers will be saved when you save a Layers File.

Canvas Buffer

Figure 4-38. The Canvas Buffer

The Canvas Buffer is the bottom buffer in the Buffers Panel. It allows quick panning on the Canvas image, if the Canvas is magnified. The Canvas Buffer displays a thumbnail of the full Canvas with a wireframe box representing the magnified area in relation to the whole picture. The wireframe rectangle follows the position of the magnified screen in

real time. When the Canvas is magnified (see ***page 4-64***, press in the wireframe and drag it to pan the image in the Canvas.

The Canvas Buffer has its own blue Undo (U) and Redo (R) Buttons.

Mag Window

The Mag Button next to the Canvas Button displays the current level of magnification of the Canvas (1 = no magnification, 2 = two times magnification, etc.).

X and Y Windows

The X and Y windows display the x,y location of the lower left corner of the magnified wireframe. You can re-position the wireframe (pan the Canvas) by pressing in one of the X, Y Windows and entering a new number. The wireframe (and magnified Canvas display) jumps to the new position.

Alpha (A) Slider

This is the same alpha slider that appears in the color palette. It is used to set the opacity (alpha) of many of Liberty's imaging functions, such as Painting.

4.9 TRANSFER PANEL

Figure 4-39. Transfer Panel

The Transfer Panel is where you do all saving and recalling of files, as well as cutting and pasting. It gets its name from the fact that its functions all transfer a picture or part of a picture from one place to another. The Transfer Panel usually appears in the leftmost panel position at startup. It's a good idea to leave it in that position, though you can put it in any of the four panel positions. It's easier to use if it's always in the same, familiar place.

Disk Recall and Save - A Quick Look

The Save File and Recall File Buttons are treated in detail on ***page 4-158***.

For simple save or recall of Canvas pictures:

- **Press either the Save File or Recall File Button.** The File Popup appears.

- **Type the filename you want to save or recall, then press the Enter key. Or, instead of typing the filename you can press directly on the filename in the file list displayed in the File Popup.** If you are saving, the contents of the Canvas picture is saved on disk under the file

name you type. If recalling, the file whose name you type is recalled onto the Canvas, after erasing the previous picture. Afterwards, the File Popup automatically disappears.

Cut & Paste Functions

For all cutting and pasting Liberty uses the currently selected Temp Buffer in the Buffers Panel and Cut and Paste functions in the Transfer Panel. The Cut Button cuts the whole Canvas (the default) or the masked area of the Canvas (when a mask is active) and puts it in the Temp Buffer. The various Paste Modes paste the contents of the Temp Buffer into the Canvas.

4.9.1 Cut Button

Press the Cut Button with no mask active on the Canvas and the entire Canvas picture is cut into the Temp Buffer. The previous contents of the Temp Buffer is erased and the new element appears in the selected Temp Buffer in the Buffers Panel. If the Palette panel is displayed rather than the Buffers Panel, the cut is still accomplished. If a mask is active on the Canvas, then only the masked area is cut into the Temp Buffer.

Using Prefix Modes

Use the Add Prefix Button with Cut to add the Canvas picture to the picture in the Temp Buffer. The cut element appears on top of the contents of the Temp Buffer, which is not erased.

Use the Under Prefix and Add Prefix Buttons with Cut to cut under the Temp Buffer. The cut element appears under the contents of the Temp Buffer, which is not erased.

4.9.2 Move Button

The Move Button performs just like the Cut Button, except that the Canvas or the masked area of the Canvas is erased, cut into the Temp Buffer, and given to you at the end of your pen for manual positioning and pasting back onto the Canvas in a new place.

To Move an element on the Canvas:

- **Mask the element on the Canvas.** See the section on masking, page 4-363.
- **Press the Move Button.** The masked element is erased from its original position, cut to the Temp Buffer, and its preview appears at the end of your pen (or mouse) for positioning on the Canvas. The type of preview displayed (wireframe, coarse, final, final + alpha, etc.) is determined by the current setting in the Paste Popup.
- **Press down to paste the element into its new position on the Canvas.**

Move with the Repeat Prefix

Stays in Paste Mode so you can repeatedly paste the image until you press Move again to turn it off.

Move with the Add Prefix

When the image is cut from the canvas, it is added on top of the contents of the Temp Buffer. Then you can manually position and paste the composited contents of the Temp Buffer into the Canvas.

Move with the Add and Copy Prefixes

Same as Move with Add but without manual positioning. Erases the masked area, adds it on top of the Temp Buffer, then pastes the composited contents of the Temp Buffer onto the Canvas with all elements in their original positions. This has the effect of pasting the masked element back down into its original position with the contents of the Temp Buffer under it.

4.9.3 Paste Button

Paste takes the contents of the selected Temp Buffer and pastes it onto the Canvas. This function is the counterpart to Cut.

Figure 4-40. Paste Modes

Liberty has six paste modes. These are:

- **Normal**
- **Color**
- **Shadow**
- **Extrude**

- **Emboss**
- **Distort (3D Perspective)**

The small window inside the Paste Button shows the current paste mode. Pressing on the sides of the window cycles through the paste modes (see ***"Paste Modes Popup" on page 4-112***). Pressing directly on the center of the mode name brings up a list of all the paste modes. Press on one of the mode buttons to choose that mode.

To paste an element into the Canvas:

- **Press the Paste Button.** (There must be an image in the selected Temp Buffer.)
- **Move the cursor onto the Canvas.** A preview of the image to be pasted appears on the Canvas. You control its position by moving the pen (or mouse). The preview of the element to be pasted depends on the current preview setting in the Paste Popup.
- **Press down when the previewed image is where you want it.** The image is pasted permanently into the Canvas at full resolution using the current paste mode (Normal, Shadow, Emboss, etc.).

The setting of the Transparency Slider in the Palette Panel determines the transparency of the pasted element.

In the Mask Tools Panel, Paste Mask pastes the alpha of the contents of the Temp Buffer into the Mask.

Paste Popups

There are two ways to use the Paste functions. One is just to press in the main part of the Paste Button and paste the image manually into the Canvas, as described above. The paste will be performed using the current settings of the Paste Popup, though the Paste Popup is not displayed in manual mode. The second way is to press in the corner popup button of Paste, which brings up the Paste Popup which allows you to adjust settings for pasting the image into the Canvas. Using the Paste Popup, the paste is performed by pressing the OK Button when the image is in the desired position, which can be far more precise than manual positioning. The mode displayed in the Paste window (Normal, Shadow, etc.) determines what popup appears.

Paste with Prefix Buttons

Use the Under Prefix Button with Paste to paste the image under the picture on the Canvas, showing through where the Canvas picture is transparent.

Press the Repeat Prefix Button, then the Paste Button to paste the image repeatedly until pressing the Paste Button again to turn it off.

Press the Copy Prefix Button, then the Paste Button to paste the image exactly in its original position (as it is in the Temp Buffer).

Press the Copy and the Repeat Prefix Buttons, then the Paste Button to paste the image in its last-pasted position.

4.9.4 Paste Modes Popup

Each Paste Mode has its own Popup Menu with extensive tools for controlling the settings of that mode.

To call up the popup for a paste mode, press the corner button of the Paste Button with the desired paste mode displayed in the mode window.

Paste Mode Selection

Once the Paste Popup is on the screen, the bottom right corner of the popup will identify the Paste Mode selected (Normal, Color, Shadow, Extrude, Emboss, or Distort.)

To change the Paste Mode, press on the arrows on either side of the Paste Mode name to cycle through the six modes, stopping at the desired mode.

4.9.5 Paste Normal Mode

Paste Normal is the only paste mode with no effects. It pastes the contents of the Transfer Panel into the Canvas without altering them (although you can vary the transparency of the pasted image depending on the setting of the Transparency Slider Scale in the Palette Panel).

To access the Paste Normal Popup, press the corner button of the Paste Button, when “Normal” is displayed in the mode window of the Paste Button. The Paste Normal Popup appears, and a preview of the pasted image appears on the Canvas.

Paste Normal Popup

Figure 4-41. Paste Normal Popup

The Paste Normal Popup contains commands for precise placement of the pasted image. These standard placement functions appear on the popups for all the other paste modes.

The Preview Button

This button changes preview modes for the pasted image on the Canvas. Press on the Mode window to cycle through the preview modes. These are (from fastest to slowest):

- **Wireframe**
- **Coarse**
- **Final - full resolution, transparency displays as opaque black**

- **Final plus alpha - full resolution and full transparency**

The preview modes are the same for all the paste modes, except Paste Distort, which also has five filters designed for perspective rendering. Note that on the newer SGI systems, Final+Alpha preview is very fast. On such systems, the Coarse and Final previews are not required.

Positioning

To manually position an object on the Canvas, press down on the preview of the object and drag it, positioning the object as desired. You can repeat this operation as often as you want. You can constrain the direction of movement horizontally or vertically by turning off (and on) the X and Y modes under the Pen Position Button. You can constrain the direction of movement to any angle by turning off both the X and Y modes and turning on the Direction Button (the little "clock" at the right of the Brush Display).

The Center Button

Press the Center Button to center the image on the Canvas.

The Inplace Button

Press the Inplace Button to position the image at its original position (as it is in the Temp Buffer).

The Adjust Button

Use the Adjust Button for precise, pixel-by-pixel positioning.

Press the Plus or Minus Adjust Buttons to move the object by the number of pixels shown in the window of the Adjust Button, along whatever axis is turned on, X or Y, or both (diagonal). Press the Plus (+) Button to move in a positive direction. Press the Minus (-) Button to move in a negative direction. Each time you press, the object moves incrementally the number of pixels in the Adjust window. You can tap repeatedly on the Plus or Minus Buttons, or hold them down for continuous movement. To change the number of pixels moved, press in the window of the Adjust Button and type in a new number.

The OK, Erase, and Cancel Buttons

Perform the final paste by pressing the OK Button. Press the Erase Button to perform the final paste after erasing the Canvas. Press the Cancel Button to remove the popup without performing the paste.

The Paste Elevator

The current settings of the popup are saved in the current Paste Elevator level. When you press on another elevator level, the settings in the popup change to those saved in the new level. You can save six different paste set-ups in the elevator, giving each of the set-ups a name with the Name Button, if you want to. Press in the Name Button and type in a name; then that name will be displayed whenever you press on that elevator level.

4.9.6 Paste Color Mode

Use Paste Color Mode to paste a blurred copy of the object or to paste a silhouette of the object in a single color.

Paste Color Popup

Figure 4-42. Paste Color Popup

The Paste Color Popup is the same as the Paste Normal Popup with the addition of the Blur functions and a mode button for choosing the source of the color in the pasted image. The source for the color of the pasted image can be one of three modes: (1) Palette (the current color box), (2) Image (the object itself), or (3) Light (the image on the Canvas plus the setting of the Light Slider).

The Paste Color Blur Functions

The Blur Sliders work the same as the Blur Popup in the Image Tools Panel Menu, see page 4-324. They range from 0 to 15, where anything less than 1 is no blur and 15 is maximum blur. When Blur is greater than 0, the object "grows" by the number used.

Source Color for the Paste

At the top of the Blur Sliders is a Color Source Button controlling the source of the color for the paste. Pressing this button cycles among three modes: Palette, Image, and Light.

In Palette Mode, the object is pasted in the current color.

In Image Mode, the object is pasted using the original colors of the original image, but blurred according to the Blur Sliders.

In Light Mode, the object is pasted as a lighter or darker silhouette over the Canvas. However, there must be some picture information on the Canvas for this mode to brighten or darken. (If the Canvas is empty, this mode will do nothing and you should use Palette Mode.) When you have chosen Light Mode, a slider scale is displayed, the Light Slider. As in other paste modes, use the Light Slider to set the brightness or darkness of the pasted image. The slider has a range from -100 to 200. Anything below zero darkens the Canvas; anything above zero brightens.

The OK, Erase, and Cancel Buttons

Perform the final paste by pressing the OK Button. Press the Erase Button to perform the final paste after erasing the Canvas. Press the Cancel Button to remove the popup without performing the paste.

The Paste Color Elevator

You can save settings of the popup in the six levels of the elevator, giving each level a name with the Name Button.

4.9.7 Paste Shadow Mode

Paste Shadow Mode works like Paste Normal but also creates and pastes an automatic drop shadow for the pasted contents of the Temp Buffer.

Paste Shadow Popup

The Paste Shadow commands are similar to Paste Color commands with the addition of controls for transparency and the shadow angle and offset.

In Paste Shadow, moving the pen on the canvas controls either the image position or the position of the shadow, based on whether the “Pen Position,” “Offset”, and “Angle of Shadow” buttons are highlighted (on). If all buttons are highlighted, the pen moves the image and shadow together. If the offset and angle buttons are highlighted, moving the pen only controls the shadow position. If just the Angle button is on, moving the pen only changes the shadow angle, and so on.

The Pen Position Buttons work the same as in all other paste modes, controlling the position of the original image to be pasted.

The Adjust functions allow fine positioning for the original image to be pasted, as in other paste modes.

The Blur Sliders work the same as Paste Color and control the blur of the drop shadow.

The Transparency Slider on the Paste Shadow Popup controls the transparency of the drop shadow (not the image itself).

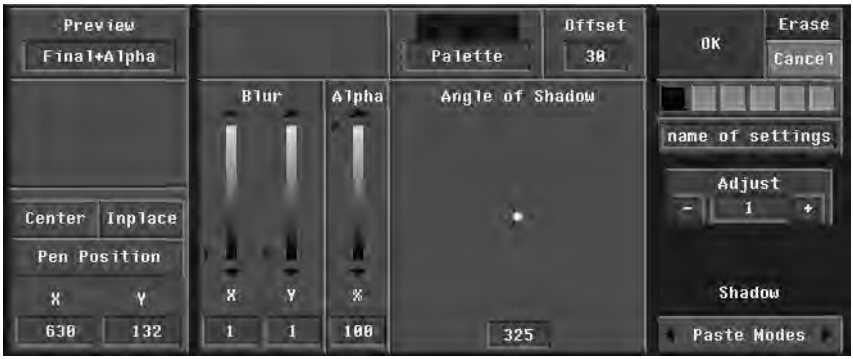

Figure 4-43. Paste Shadow Popup

Shadow Angle Button

The clock-like button is the Shadow Angle Button and controls the angle of the shadow. The preview of the drop shadow is always a wireframe box, regardless of what preview mode is active for the image to be pasted.

To move the angle manually, ensure that the "Angle of Shadow" button is highlighted, then press on the canvas near the shadow wireframe box and drag it. The Angle Button changes to reflect the changes you're making manually on-screen. The offset distance of the shadow from the original image also changes when you drag the shadow wireframe box, if the "Offset" button is highlighted.

You can also press on the Angle Button and drag the dot around the outside of the "clock." The angle of the wireframe box on the Canvas is updated to reflect the changes you're making on the Angle Button. The distance does not change. The window at the bottom of the Angle Button shows the angle in degrees. You can change this value by pressing directly on the window and typing in a new number, followed by the Enter key.

The window at the top right of the Angle Button shows the offset distance in pixels. You can change this value by pressing directly on the offset window and typing in a new number, followed by the Enter key.

Source Color for the Drop Shadow

At the top of the Angle Button is a Color Source Button controlling the source of the color for the drop shadow. The label of this button cycles among three modes: Palette, Image, and Light.

In Palette Mode, the drop shadow is pasted in the current color. Normally you would choose black in the Color Palette.

In Image Mode, the drop "shadow" is pasted using the original colors of the original image to be shadowed, but blurred according to the Blur Sliders. This is useful if you want an effect that resembles a blurred reflection of the object, rather than a shadow.

In Light Mode, the shadow is pasted as a lighter or darker silhouette over the Canvas. However, there must be some picture information on the Canvas for this mode to lighten or darken. If the Canvas is

empty, this mode will do nothing, and you should use Palette Mode. As in Paste Color, use the Light Slider to set the lightness or darkness of the shadow.

OK, Erase, and Cancel Buttons

Perform the final paste by pressing the OK Button. Press the Erase Button to perform the final paste after erasing the Canvas. Press the Cancel Button to remove the popup without performing the paste.

Paste Shadow Elevator

You can save settings of the popup in the elevator, giving each setting a name with the Name Button.

4.9.8 Paste Extrude Mode

Paste Extrude creates a "3D" extrusion of the image to be pasted. Essentially, this looks like a solid 3D edge of variable thickness and color gradated over the depth of the extrusion.

Paste Extrude Popup

The commands on the Paste Extrude popup (Figure 4-44) are the same as for Paste Shadow, but more control is given for defining a range of colors, blur factors, and alpha values across the entire extrusion.

The Pen Position Buttons work the same as in all other paste modes, controlling the position of the original image to be pasted.

The Adjust functions allow fine positioning for the main image to be pasted, as in the other paste modes. The Center and Inplace Buttons also work the same as in the other paste modes.

Above the Center and Inplace Position Buttons is a Color Source Button for the original image to be pasted (labeled “Paste”). Its three modes are Image, Clear and Light.

In Image Mode, the original image is first pasted, prior to being extruded. In Clear Mode, the original image is pasted transparently so that only the extruded edge appears. In Light Mode, the original image is pasted as a lighter or darker silhouette on top of the extrusion. As in Paste Color, use the Light Slider to set the lightness or darkness of the silhouette of the original image.

The Blur Sliders work the same as in other paste modes, but have Near and Far settings, allowing you to set one blur factor for the part of the extrusion nearest the object and a different blur factor for the part of the extrusion farthest from the object.

The Alpha slider also has Near and Far settings so you can vary the transparency of the extrusion between its near and far edges.

Depending on which number windows are turned on, the Adjust Button affects X and Y position, X and Y blur (Near and Far), alpha % (Near and Far), Extrusion Angle, and Extrusion Length.

Also, depending on which windows are turned on, pen position can affect image position, extrusion, angle offset, or all three.

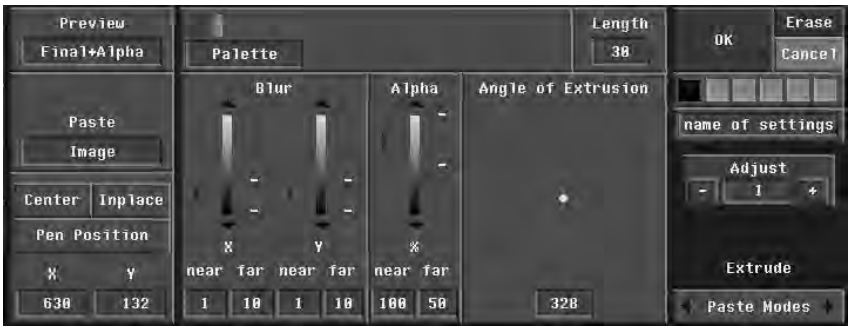

Figure 4-44. Paste Extrude Popup

Extrusion Angle Button

The clock-like button is the Extrusion Angle Button (similar to the Shadow Angle Button) and controls the angle of the extrusion relative to the original object to be pasted. The preview of the extrusion is always a wireframe box, regardless of what preview mode is on for the main part of the image to be pasted.

To adjust the extrusion angle manually, ensure that the Angle button is on (highlighted), then press on the canvas near the extrusion wireframe box, and drag it. The Angle Button changes to reflect the changes you're making manually on-screen. If the Length button is also on (highlighted), the length of the extrusion changes as well.

You can also press on the Angle Button and drag the dot around the outside of the "clock." The angle of the wireframe box on the Canvas is updated to reflect the changes you're making on the Angle Button.

The window at the bottom of the Angle Button shows the angle in degrees. The window at the top right of the Angle Button shows the length of the extrusion in pixels. You can change either of these values by pressing directly on the window and typing in a new number, followed by the Enter key.

Source Color for the Extrusion

At the top of the Blur Sliders is a Color Source Button controlling the source of the color(s) for the extrusion. Press this button to cycle between two modes: Palette and Image.

In Palette Mode, the extrusion is created in the current color, or, if Multiple Colors are on in the Palette, it is extruded along a gradation of the chosen colors. Palette is the most common mode.

In Image Mode, the extrusion is made using the original image, so that the extruded edge looks like it has "grown" out of the image itself.

Extrude Preview

Above the Color Source Button is an Extrude Preview box that displays the colors and length of the extrusion. When the source color is in "Palette" mode, the horizontal width of the box is determined by the current length of the extrusion. If you make changes in the Palette colors to be used in the extrusion, press on the Extrude Preview Box to update its display of the new colors.

OK, Erase, and Cancel Buttons

Perform the final paste by pressing the OK Button. Press the Erase Button to perform the final paste after erasing the Canvas. Press the Cancel Button to remove the popup without performing the paste.

Paste Extrude Elevator

You can save settings of the popup in the elevator, giving each setting a name with the Name Button.

4.9.9 Paste Emboss Mode

Paste Emboss is used to automatically emboss the pasted image.

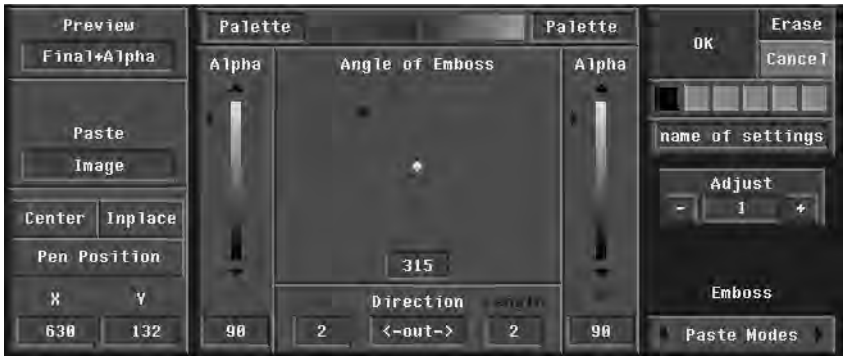

Figure 4-45. Paste Emboss Popup

Paste Emboss Popup

The Paste Emboss tools (Figure 4-45) are similar to the other paste modes, with additional controls for determining the colors and sizes of two opposite directional edges.

Emboss Angle Button

The clock-like button is the Emboss Angle Button (similar to the Extrusion Angle Button) which controls the angle of the embossed edges. The red dot is the active angle (the one displayed in the Angle window below) and the blue dot is always 180 degrees away from it. The function buttons (alpha, color source & length, etc.) at the left of the Angle Button are linked to the red dot; the ones at the right are linked to the blue dot. To set the emboss angle, press the pen down on the Angle Button and drag the dot around the outside of the "clock." The embossed image has no preview, since the emboss distance is too small to preview. The Angle Window at the bottom of the Angle Button shows the emboss angle in degrees. The Length Windows at either side of the Angle Window display the length of the two emboss edges, in pixels. You can change any one of these numeric values by pressing directly on its window and typing in a new number, followed by the Enter key. You can set the Direction Button (below the Emboss Angle Button) to "Out" for an outward embossed edge, or "In" for an inward embossed edge. "In" is useful if you want to emboss something, yet retain its original shape. "Out" grows the edges outward so that the original image is not affected.

Use the dual controls for alpha and color source, as well as length, to define independently the two opposite embossed edges. As mentioned above, the left buttons are linked to the red dot on the "clock;" the right buttons are linked to the blue dot.

Source Colors for the Emboss

At the top of the Angle Button are two Color Source Buttons controlling the source(s) of the color for the emboss. These buttons cycle among the same three labels as most of the other paste modes: Palette, Image, and Light.

In Palette Mode, the embossed edge is created using colors from the Palette. If both Color Source Buttons are set to Palette, the maximum number of colors that can be used is four. If both Color Source buttons are set to Palette and two colors are used, the first chosen color in the Palette goes to the edge represented by the red dot on the Angle Button, the second color goes to the edge represented by the blue dot. Each edge is one color. If three colors are chosen on the Palette, the edge represented by the red dot is gradated from the first color chosen on the Palette to the middle color, and the edge represented by the blue dot is gradated from the middle color to the last color chosen on the Palette. If both Color Source Buttons are set to Palette and four colors are chosen on the Palette, the edge represented by the red dot is gradated from the first to the second color, and the edge represented by the blue dot is gradated from the third color to the fourth color.

Note that when selecting source colors for the Emboss, there can be more than four colors selected in the color palette. In this case, the first two colors selected in the color palette apply to the edge represented by the Red dot, and the last two colors selected in the color palette apply to the edge represented by the Blue dot.

In Image Mode each embossed edge uses the original colors of the original image, similar to Paste Extrude.

In Light Mode, the embossed edge is pasted as a lighter or darker silhouette over the Canvas. However, there must be some picture information on the Canvas for this mode to lighten or darken. If the Canvas is empty, this mode will do nothing and you should use Palette Mode. As in Paste Color, use the Light Slider to set the lightness or darkness of the shadow.

Since each of the two embossed edges has its own independent controls, you can mix and match these Color Source Modes for a wide variety of effects.

The buttons controlling the pasting of the original image are the same as in Paste Extrude. The Pen Position Buttons work the same as in all other paste modes, controlling only the position of the original image to be pasted.

The Adjust functions allow fine positioning for the main image to be pasted, as in the other paste modes. The Center and Inplace Buttons also work in the same manner as the other paste modes.

Above the Center and Inplace Position Buttons is a Color Source Button for the original image to be pasted (labeled “Paste”). Its three modes are Image, Clear and Light.

In Image Mode, the original image is pasted in the current color.

In Clear Mode, the original image is pasted transparently so that only the embossed edges appear. This is useful for “blind” embossing.

In Light Mode, the original image is pasted as a lighter or darker silhouette on top of the extrusion.

OK, Erase, and Cancel Buttons

Perform the final paste by pressing the OK Button. Press the Erase Button to perform the final paste after erasing the Canvas. Press the Cancel Button to remove the popup without performing the paste.

Paste Emboss Elevator

You can save settings of the popup in the elevator, giving each of the settings a name with the Name Button.

4.9.10 Paste Distort Mode

You perform all sizing and perspective transformations in Paste Distort, as well as slanting, mirroring, and corner warping. *Paste Distort supports sub-pixel positioning.*

Paste Distort Popup

Figure 4-46. Paste Distort Popup

The Distort Popup has the same look and feel as the other paste modes. The only difference is that it has tools for manipulating the image in a three-dimensional world. In addition to the standard paste functions, the Paste Distort Popup has tools for rotation in X, Y, and Z; scaling in X and Y; mirroring in X and Y; and slanting in X and Y.

Sub-pixel Positioning

Paste Distort allows extra-precise positioning of elements being distorted and pasted. An image being pasted does not have to be deposited pixel-for-pixel on the image below it, but with a slight offset or overlap of the edges of the pixels it's being pasted on. Certain filter options (Adaptive) allow user-definition of how fine a "grid" to use to position the element. You can also use this feature, if you have Liberty's Animation Option, for very slow-moving elements.

NOTE

For sub-pixel positioning to occur, the keyframe must have either a non-zero rotation, slant or three-position set, or scale value(s) other than one set (if only positional movement is desired, set the X and Y scale to 0.99 to invoke sub-pixel positioning). In addition, use either the bilinear or adaptive filter to achieve subpixel positioning. See *"About Filters" on page 4-137* for more information.

Perspective Transform and Warp Corners

The Distort Paste Popup has two distinct modes that you interact with differently. Perspective Transform allows you to set up a full three-dimensional world in which to manipulate images. Warp Corners allows you to perform arbitrary perspective mapping

between the original image and a user-definable quadrilateral. In the middle of the left panel of the Distort Popup is a button labeled either Transform or Warp Corners. Press this button to toggle back and forth between the two modes. The wireframe preview on the Canvas displays an XYZ axis when Perspective Transform is active and displays a cross when Warp Corners mode is active.

Perspective Transform

Perspective Transform displays a panel in the middle of the Distort Popup. This panel has five main modes - five different ways to manipulate the image to be pasted. These modes are Position, Rotation, Slant, Mirror and Scale. Each mode displays coordinate "handles" to press and drag the wireframe. Dragging each handle manipulates the image in a particular way. For instance, when Scale Mode is highlighted in the Distort Popup, dragging on a handle causes scaling. When Rotation Mode is highlighted in the Distort Popup, dragging on a handle causes rotation.

Position Button

You can always re-position the image or axis, regardless of what other mode is active. To move the image manually, press on its axis (the XYZ icon) and drag it in the desired direction. If another mode (such as rotation) is active, it becomes temporarily disabled until you are finished dragging the image.

Press the Position button to enter Position mode. Dragging the on-screen handles on the wireframe causes it to move in X or Y. Dragging the axis moves the wireframe in any direction.

The Position X and Y windows display the current coordinates of the image to be pasted. When the toggle button above the y window displays the label "Image," the coordinates indicate the center of the image to be pasted. When that button displays the label "Axis," the coordinates indicate the XY position of the rotational axis of the image. It is possible to separate the axis from the image center using the Lock button (see below).

Axis Lock Button (Global and Local)

Above the Z window is a Lock Button, which, when turned on, locks the axis to the image. This is Global Mode, because the locked axis and image move around together inside a "world" defined by the Canvas. When the Lock Button is turned off, the axis is free of the image and can be moved completely away from it. This is Local Mode because the axis now defines local coordinates that the image refers to. It is generally better to perform Global moves first, then Local ones.

Image/Axis Button

Above the Y window is an Image/Axis button. When the Lock button is off, and the Image Axis button is in "Image" mode, dragging the on-screen handles moves the image independent of the axis. When the Image Axis button is in the "Axis" mode, dragging the on-screen handles moves the axis independent of the image. When the Lock button is on, dragging the on-screen handles positions both the image and the axis together.

Rotation Button

Press on the word "Rotation" to enable Rotation Mode. Press and drag on the wireframe's handles to rotate the image in X, Y, or Z. The image always

rotates around the axis position (as opposed to the center of the image). For example, the axis can be placed at the corner of the image, so that rotation occurs around that point. Refer to the previous sections for information on how to position the axis.

Slant Button

Press on the word "Slant" to enable Slant Mode. Press and drag on the wireframe's handles to slant the image in X or y.

Scale Button

Press on the word "Scale" to enable Scale Mode. Press and drag on the wireframe's handles to scale the image in X and/or Y. Dragging on a corner handle scales the image in both X and Y. Dragging on a handle in the center of a side scales the image only in X or Y.

The scale of the image can be represented as a ratio (1.0 = 100%) or as a size in pixels. Tap on the small arrow to the right of the word "Scale" to toggle back and forth between the two modes.

Scale Lock Button

The Lock Button just above the Mirror Buttons is the Scale Lock Button. Press it to turn it on or off. When on, one edge of the image is held stationary while you drag the opposite edge and scale the image. If the image has already been rotated, you may have to unlock global positioning (the Axis Lock Button) to truly hold an edge in three-dimensional space.

Mirror Buttons

Press the X Mirror Button or Y Mirror Button to "reflect" the image across the X or Y axis. The Mirror Buttons are mode buttons; when one or both of them is "on," mirroring takes place.

Eye Button

The magenta Eye Button is used to customize the *look* of the perspective transformation. This is done by defining where the center of projection of the image is located.

Eye Popup

Figure 4-47. Eye Popup

Press the Eye Button to call up the Eye Popup, which has three buttons: Image, Axis, and Fixed. In Image Mode the center of projection is centered on the middle of the image, regardless of where the axis may be. In Axis Mode, the center of projection is centered on the axis. In Fixed Mode, you can choose any point in space to be the center of projection.

Any center of projection has by default a depth distance from the Canvas equal to the height of the Canvas. You can adjust this depth in Z in all three Eye modes to create unique distortions. You can use a large negative depth ("in front of" the Canvas) to achieve a parallel projection.

Reset Button

Press the red Reset Button to zero out the current settings. Reset has a "soft" and a "hard" mode. If a distort effect (Rotation, Scale, etc.) is active, pressing the Reset Button resets only the active setting of that effect (soft reset). If no distort effects are active, pressing Reset resets all the settings in the Distort Popup, including any changes made to the Eye settings.

Warp Corners

When the Transform/Warp Button label says Transform, press it to change to Warp Corners mode (the Transform/Warp Button is above the Center and Inplace buttons). The current Perspective Transform wireframe is mapped to a Warp Corners wireframe. This allows you to do touch-up work on the three-dimensional distortion.

NOTE

For Warp Corners to work, the wireframe must form a convex polygon. If the wireframe becomes concave, any active paste preview stops updating and the wireframe changes colors. To correct this, move the corner outward until the wireframe becomes convex.

Warp Popup

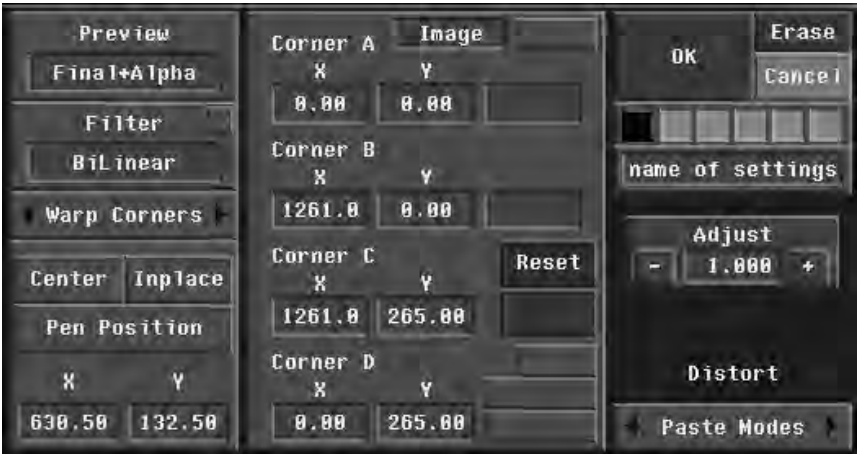

Figure 4-48. Warp Popup

The Warp Corners Popup is much simpler than the Perspective Transform Popup. Warp generates the entire three-dimensional world simply by interpreting how you deform the wireframe. Dragging a corner of the wireframe allows you to position one corner at a time to distort (or warp) the wireframe. Dragging on the center cross allows you to move the entire wireframe.

The Image/Texture Button

This button is your access to Texture Mode which lets you detach the corner points from the image being warped. This has application for Motion Tracking in the Animation Environment (see page 5-207).

Press the Image Button to toggle it to “Texture” mode. This displays a green wireframe representing the image. You can then detach the green wireframe, along with the image, from the (yellow) corner

points by moving its center point. You can also adjust its corners to rescale the image relative to the original (yellow) corner points. During these operations, the image stays in the same perspective as the corner points.

Distort Filters

Distort Paste has its own rendering filters, three preset and two user-definable. You should experiment to determine which ones are best for your applications. The Point Filter corresponds roughly to Coarse filtering; the Bilinear Filter to Medium filtering; and the Adaptive Filter to Fine filtering. Point Filter is the default filter--- fast but a bit coarse.

About Filters

Two stages are required to properly reconstruct an image in 3-D perspective. The first stage is an interpolation (or reconstruction) stage, and the second is an anti-aliasing stage. If you want to understand filters better, the following will give you a quick explanation of how filters work. This will also help you understand the User-defined filters.

Interpolation

There are two methods used to interpolate (or reconstruct) the image from two-dimensional space into the specified three-dimensional space. The two methods are (1) nearest neighbor, and (2) linear.

Nearest neighbor chooses pixels based on the nearest sample pixel. This maintains sharpness when the image is enlarged and reduced. However, when you scale an element up from small to very large this method produces blocky results.

Linear interpolation chooses pixels based on the nearest four neighboring pixels. This offers better quality than nearest neighbor, with slightly greater cost in rendering time. However, smoothing is introduced into the image, meaning that the image gets a bit soft.

Anti-aliasing

Any interpolation method introduces artifacts, which must be countered with anti-aliasing techniques. Liberty has two methods: point sampling and adaptive supersampling.

Point sampling is the simplest and quickest of the two. It takes the pixels straight from the interpolation stage with no extra calculations. For objects that are smoothly-varying (that is, continuous-tone, like a photo image) this may be acceptable. But for high-contrast images, this may not do the job.

Adaptive supersampling is more complex. It always produces the highest-quality render. This method looks at the image and finds all areas where there are high-contrast changes. When it finds them, it drops a subpixel grid on the image and approximates the pixel based on an average.

The point filter is the only filter that doesn't do subpixel positioning. The adaptive supersampling filter is very sophisticated. Both user-definable filters are adaptive supersampling filters.

User-defined Distort Filters

Figure 4-49. User-defined Filter Popup

Press the corner button of the Filter Button to bring up the Adaptive Filter Popup, which allows you to define thresholds for the different channels (RGBA) in the image, as well as the resolution for each subpixel grid to be used. The thresholds use defaults that take into account the human eye's sensitivity to the green color channel, as well as stair-stepping of the image. Press the Matte Button to display a white edge trace where the filter finds high-contrast changes. Press the Level button to specify the number of subpixels to be used in the render. A level of six means thirty-six subpixels will be used for each pixel in the original image. More is not necessarily better here, but more is definitely slower.

The Paste Distort Preview Modes

Paste Distort has three Preview Modes: Wireframe, Final, and Final Plus Alpha. Paste Distort always displays a wireframe bounding box, whatever the preview mode. In Final mode, a full resolution preview of the image is displayed on the bounding box. In Final + Alpha mode, preview takes alpha (transparency) of the image into account. You manipulate the wireframe box in real time on the Canvas. Note

that on the newer SGI systems, Final+Alpha preview is very fast. On such systems, the Coarse and Final previews are not required.

Keypad Controls for Paste Functions

You can use the keypad at the right of the keyboard to manipulation the paste functions. The functions of the keypad keys are dependent on which mode the menu is in (position, rotation, scale, or slant.)

NOTE

The Num Lock must be off for Keypad Control to work.

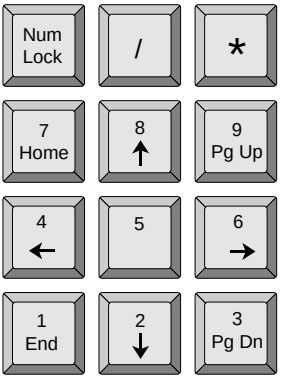

Figure 4-50. Numeric Keypad

Table 4-1: Numeric Keypad Keys/Functions

Key	Function
/	Turns off final preview of image
*	Turns on final preview of image
7/Home	Decreases Z position, increases Z rotation, decreases X, Y scale
8/↑	Increases Y position, increases X rotation, increases Y slant, increases Y scale

Table 4-1: Numeric Keypad Keys/Functions

Key	Function
9/page up	Increases Z position, decreases Z rotation, increases X, Y scale
4/←	Decreases X position, increases Y rotation, decreases X slant, decreases X scale
5	Reset
6/→	Increases X position, decreases Y rotation, increases X slant, increases X scale
1/END	In place
2/↓	Decreases Y position, decreases X rotation, decreases Y slant, decreases Y scale.
3/page dn	Center

Realtime Paste/Distort Preview on Some Platforms

On platforms that support realtime performance, previews of Paste Distort/Warp update smoothly and continuously as the Paste bounding box is changed (using the Paste Popup, the pen/mouse controls on the Canvas, or keyboard controls). On slower platforms Final+alpha previews are done in software, with the previews only being updated when the controls are released (for example, when the pen is released from the Canvas controls).

In some cases, even on platforms capable of realtime performance, in cases of large images or when multiple images are being distorted/warped in Layers, some previews will be done in software (with the same interactivity as on slower hardware platforms).

Paste Mode Button

The Paste Mode Button toggles through the modes of the current paste operation. The Paste Mode button cycles between Normal, Color, Shadow, Extrude, Emboss, or Distort.

Figure 4-51. Transfer Panel

4.9.11 Tile Button

This button tiles the Canvas by repeatedly pasting the contents of the selected Temp Buffer according to the pattern created by the Tile Set function (the corner popup of the Tile button). Use the Tile Set popup to set the horizontal and vertical offsets of the tile pattern, then press the Tile Button to render a full-screen tiled pattern.

Tile Set Popup Corner Button

(In the upper right corner of the Tile Button.) This button sets the horizontal and vertical offset of the tile pattern. You paste the image three times on the Canvas - the first time to begin the pattern, the second time to set the horizontal offset, and the third time to set the vertical offset.

To create a tiled pattern:

- 1. **Cut the element to be tiled into the Temp Buffer.**
- 2. **Press the Tile Set Popup Button.** The element to be tiled appears on the Canvas attached to the cursor.
- 3. **Press down once to set the first tile position.** The element is pasted where you press.
- 4. **Press down a second time to set the horizontal tile offset.** The element is again pasted where you press.
- 5. **Press down a third time to set the vertical tile offset.** The element is again pasted where you press.
- 6. **Double-click the Erase All Button to clear the Canvas**.
- 7. **Press the main Tile Button.** The tile fills the Canvas, row by row, according to the offsets you set.

NOTE

Once the offsets have been set, you need only press the main part of the Tile Button to automatically tile the whole screen with the image, using those offsets.

Tile Set Corner Button with the Copy Prefix

Sets the tiling positions to a rectangular grid with no gaps.

To automatically create a tiled pattern with no spaces between tiles:

- **Cut the element to be tiled into the Temp Buffer.**
- **Press the Copy Prefix, then the Tile Set Corner Button.**
- **Press the main Tile Button.** The element is tiled with no gaps.

For information about creating rectangles for seamless tiles, see Fold Paint on page 4-283.

FTP Button

Liberty's FTP function allows you to display, navigate, and browse directories on remote systems as well as recall files from them, using Liberty's File Manager tools. Using FTP allows you to access any remote system on your local network. You can also access remote FTP sites over the Internet.

Press the FTP Button to display the File Manager in the currently selected remote directory. The Full-Screen File Manager comes up by default, with Browse Mode on.

During FTP operation, you can use only Recall functions (not functions such as Copy, Delete, nor any of the Select functions, such as All, Clear, etc.). The File Path elevator is also disabled during FTP operation.

To specify the remote host name, directory, and other settings, press the corner button of the FTP Button, which calls up the FTP Popup.

FTP Popup

Figure 4-52. The FTP Popup

The FTP Popup has windows for entering set-up information to log on to a remote system.

Node

Enter the node name of the remote system (such as "infinit").

Path

Enter the path of the directory on the remote system you wish to access (such as C/logos/message) NOTE: For iNFiNiT! and Imagestor! systems, the path name should be in all upper case characters!

ImageStor! Database Server Node (Optional)

If ImageStor! thumbnails are stored in a directory other than the ImageStor! files themselves, entering the host node here will cause Liberty to query the database to find the thumbnails so they can be browsed. You don't need to set this field if ImageStor! files and their thumbnails are always stored in the same directory, or if the files you wish to browse/recall are not Imagestor! files.

User Name

Enter the user name used to log on to the remote system (such as “guest”). This user name must correspond to a user account on the remote system.

Password

Enter the password used to log on to the remote system. This password must correspond to the password for the user account on the remote system.

Temp Directory

Enter a temporary directory on the local hard drive where temporary files can be stored. Normally this is set to “usr/tmp,” but you can specify a different location if space is tight on the “usr” drive. All files browsed or recalled via FTP pass through this temporary directory, so it needs at least a few megabytes of free space.

FTP Settings Elevator

Use the six levels of the elevator to save settings for different remote hosts/directories.

Note on Browse Images

Any ImageStor! files or other browsable file formats in the remote directory display as thumbnails when the File Manager is in browse mode. Images with browse thumbnails embedded in their images are not displayed, because the entire image would have to be recalled in order to display the thumbnail, which would be too slow.

To access a remote host via FTP:

- 1. **Press the main FTP Button.** The File Manager comes up, displaying the specified directory on the specified remote host.

- 2. **Press on a filename or browse image**. The file is recalled to the Canvas as in normal non-FTP operation from the hard drive. (As in normal operation, you can recall to Temp, Mask, and Layers by changing recall modes with the colored File Mode Button.)

Remote Navigation

Once you are browsing a remote directory in the File Manager, you can navigate to different directories by selecting them in the directory listing at the top of the popup, in the same way as you normally would when browsing images on your hard drive. When using FTP, the File Manager is always in Path Mode. The current directory is displayed in the Path Window and you can enter directory or file names in the highlighted File Window. Also, you can use the Back Button to go to the parent directory (the next level up in the directory hierarchy).

If Browse Mode is Off

Browse Mode may be off when you are logged into a remote directory. The Browse Button has a corner button that calls up a popup that allows you to set what file data should be displayed when Browse Mode is off. Press one of the popup's buttons to enable a mode.

If the "List Size and Date" mode is on, sizes and dates of the files are displayed, if possible (some types of remote systems don't provide such information). If the "List Dimensions" mode is on, the dimensions are not shown, since such information can't be provided from remote systems. If the "Dis-

play File Format" mode is on, the format for each file is displayed. If the "ImageStor! data" mode is on, the file format is listed if it is an ImageStor! file (that is, if it has an ImageStor! thumbnail file in the same directory or an entry is in the ImageStor! database). Information identifying other image file formats is not remotely accessible.

Listing ImageStor! Database Fields in Full-Screen File Manager

When in FTP mode, press the Full Button to call up the Full-Screen File Manager. In the Full-Screen File Manager, the corner button of the Browse Button brings up a popup with options for what to display when Browse Mode is off. One of these options is "ImageStor! data." When this mode is on, it displays five ImageStor! database fields for every ImageStor! file it finds. See **page 4-177** for details.

Sorting and Filtering By ImageStor! Fields

The Sort Button in the Full-Screen File Manager calls up a Sort Popup that has five sort modes based on ImageStor! database fields.

The Sort Popup also has text entry windows whereby files are filtered on the basis of up to five ImageStor! database fields.

4.10 Grab and Show Functions

4.10.1 Grab Button

Press the Grab Button to digitize the input to the installed video board and to display that digitized image on the Canvas. The Grab Popup allows you to grab video to an optional disk array instead of the Canvas.

Grab Popup

Figure 4-53. The Grab Popup

Press the corner button of Grab to call up the Grab Popup. By default video is grabbed to the Canvas. If the Video to Disk Button is enabled, video is grabbed to a disk array. See your Liberty Technical Manual for details about the particular disk array installed on your system.

Grabbing Video to a Disk Array

Press the Video to Disk Button to enable grabbing video frames to a disk array (instead of to the Canvas).

To record a clip of video to the disk array, bring up the Grab Popup, click on the Video To Disk Button, enter the file path you want to save the clip as, and enter the number of frames you want to record. Then exit the popup and hit the Grab Button. Liberty will tell you to:

"Left Click, Spacebar or Return to grab; Right Click or Esc to abort"

The incoming video will be written to disk once you left click, for as many frames as you specified. There is some delay before the actual transfer starts, however, so be sure to click a little before the video you want. There are no provisions for triggering the start of the grab from an external source.

Once the video is grabbed to disk, you can recall it into Liberty using the disk paths in the Source VTR Set-up Popup. You can use the Source VTR Set-up Popup to assign this clip to a disk path, and the clip can be grabbed from a particular timecode location (the time-code is the frame number within the clip, which starts at zero).

You can also create a clip file through the VTR interface. Set up a target disk path in the Target VTR Set-up Popup, and change the file type in the Target VTR Set-up Popup to "RAW .yuv". Rendering to this disk path (in the VTR Panel in the Paint Environment or when rendering an Animation), then generates a video clip. The saved clip can be displayed through the video, as described in the section on Showing below.

Figure 4-54. Disk Path File Type Popup

Note that file type for a target disk path is selected by clicking on the File Type Window for the disk path in the Target VTR Set-up Popup. This brings up the Disk Path File Type Popup. The popup has a section for "Clip file formats" (corresponding to files which contain multiple frames). Select the "Raw YUV" button under "Clip file formats" to specify a clip file format.

4.10.2 Show Button

The Show Button transfers the contents of the Canvas to the installed video board frame buffer. Usually you press Show when you want to see the Canvas on the monitor output of the video board to see how it looks in NTSC or PAL. Show works at any Canvas resolution and for all video boards that can be installed with Liberty. It corrects aspect ratio at the time of the transfer. You must press the Show Button each time you want to update the video board.

Show Popup

Figure 4-55. Show Popup

Pressing the corner button of Show calls up a small popup with two options: Real-time Show and Non-Real-time Show.

Non-Real-time Show

Non-Real-time Show is the default. When this mode is active, a Show is performed each time you press the Show Button.

Real-time Show

Pressing the Real-time Show Button turns on Real-time Show Mode. The time required for Real-time Show slows some functions on certain platforms. On some platforms Real-time Show only works if the configured resolution is the same as the installed frame buffer's native resolution.

Showing Video from a Disk Array

Press the Disk to Video Button to enable showing video frames from a disk array.

To output a clip, bring up the Show Popup and make sure you are in "Realtime Show" mode. Then click on the Disk To Video Button and enter the filename of the clip you want to output to video. The Frames Window is automatically updated to the number of frames in the clip, based on the size of the file. Then exit the popup and hit the Show Button. The entire clip will be played through the video device.

The clip can also be played through the File Manager interface. When bringing up the File Manager and browsing any saved clips, you can see that they have the VTR-type controls available (H < <| |> > T). You can use these controls to play and step through the clip interactively through the video board directly from the disk array. Thus you can play and examine the clip in full resolution on the video monitor.

Set-up for Grab and Show

You set up Grab and Show using the Video Panel in the Configuration Environment. Consult the *Liberty Technical Reference Manual* for details.

The Grab function uses the Source recording device (on the Paint Environment's VTR Panel and the Configure Environment's Video Panel).

The Show function uses the Target channel (Target on the Paint Environment's VTR Panel and Tar on the Configure Environment's Video Panel).

4.11 RECALL/SAVE FILE FUNCTIONS

These buttons are used for saving files to disk or recalling images or files from disk storage.

4.11.1 Recall File Button

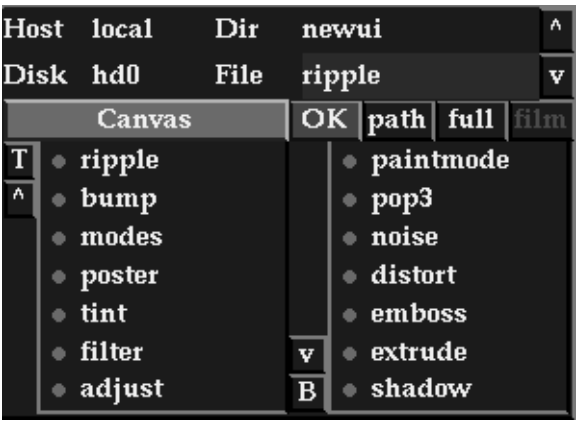

Figure 4-56. File Popup

The Recall Button allows you to recall images and other types of files from the disk.

To recall a picture file from disk to the Canvas:

- **Press the Recall Button.** The File Popup appears.
- **Press on a filename in the list of filenames, or type the filename you want to recall, followed by the Enter key.** The Canvas picture is erased and the indicated picture appears on the Canvas. The File Popup disappears.

Recall with the Add Prefix

Recalls on top of (adds to) the Canvas, Temp Buffer, or mask.

Recall into Masked Area

If there is an active mask on the Canvas, the recalled picture only appears in the masked area.

Recalling non-Liberty File Formats

Recalling a non-Liberty file format is performed just like a normal recall (see the previous page). You don't have to specify the extension when you recall a file in a non-Liberty format. However, if there is more than one file format for one file (for example, both .tga and .rla), you should specify which format to recall by typing the proper extension with the file name. For information about saving in different file formats, see "The File Save-As Popup" on page page 4-171.

File Path Elevator

6 elevator boxes are provided, each of which can hold a file path. The current elevator box keeps the current path until you change it. With the Copy Prefix you can copy a path into a different elevator box, saving it for later quick access.

4.11.2 Recall Corner Button

Press the corner button of Recall when you want to use special settings to modify how pictures are recalled. The Recall File Popup appears.

When you change a recall setting to other than normal default, the Recall Corner Button is high-lighted purple to indicate that a special recall setting is active. When you change a recall setting, it stays changed until you go back and reset it or change it again.

Recall File Popup

Figure 4-57. Recall File Popup

The Ignore Palette Button

Press the Ignore Palette Button to turn it on/off. When on (the default), it causes pictures to be recalled to the Canvas without changing the current palette colors. When off, it causes pictures to be recalled along with the colors with which they were saved.

Rescale and Orientation On Buttons

Press one of these On Buttons to activate either Rescaling or Orientation (includes Mirror) during the recall operation. Only one function can be on at a time. Pressing the Rescale On Button high-lights the Rescale Button. Pressing the Orientation On Button high-lights the Orientation/Mirror Button.

Re-scale Button

Press to display the Re-scale Popup

With the Rescale function you can automatically change the aspect ratio and/or size of pictures during recalls or saves (there is a Re-scale Button in the Save File Popup also). This is especially useful for images larger than the current Canvas size, or for images generated on systems with different pixel aspect ratios. Rescale calls up a popup that allows you to set the special scaling parameters. The default mode for both Recall and Save is "No Scaling."

When a file is rescaled during Recall or Save, Liberty displays a message in the Prompt Window displaying both the original and the rescaled xy dimensions of the image.

Rescale Popup

Figure 4-58. Rescale Popup

The No Scaling Button

When this mode is on (the default), Liberty disables all file rescaling for subsequent Recalls (or Saves). Images are recalled in the current Canvas resolution. Images larger than the current Canvas resolution are clipped when recalled.

The Automatic Button

When this mode is on, Liberty automatically rescales the file being recalled from whatever size/ aspect ratio it has on the disk to the current resolution.

The Scaling by xy Panel

When this mode is on, images are rescaled when recalled (or saved). You can set xy resolution of the source file (to be recalled) resolution and the target Canvas resolution using the four windows in the Scaling by XY Panel.

For example, if you are recalling files from the disk that are 720 x 486 to the Canvas that is 720 x 540, you enter the following:

- **File X** **720**
- **File Y** **486**
- **Canvas X** **720**
- **Canvas Y** **540**

As long as the Scaling by XY Button is active, Liberty uses these settings to rescale the recalled file, correcting for the difference in pixel aspect ratio. These four settings default to the current Canvas resolution.

The Scaling by Percent Panel

When this mode is on, images are rescaled when recalled (or saved). You can set the percentage of rescaling using the two windows in the Scaling by Percentage Panel.

For example, if you want to automatically rescale images to half their size, you would enter the following:

- X 50
- Y 50

Interpolation On Button

The Interpolation On button enables filtering of the image during re-scale. When this button is on, the image is filtered during re-scaling, which eliminates aliasing artifacts, but also blurs the image slightly. When this button is off, the image is not smoothed during re-scaling. In this case, the image will not blur, but may have aliasing artifacts.

Reset Button

Press to set all numeric settings to defaults.

The OK Button

Press to confirm changes in settings. The popup disappears. Note that when you turn on a rescaling mode, it stays on after you leave the popup and remains on until you go back into the Rescale Popup and press the No Scaling Button, or the Reset Button.

Recall Orientation Button

Press one of the four orientation modes to enable it. The 90 Button causes the recalled file to appear rotated 90 degrees on the Canvas. The 180 Button causes the recalled file to appear rotated 180 degrees on the Canvas. The 270 Button causes the recalled file to appear rotated 270 degrees on the Canvas. The default is 0, or no rotation. This feature is very useful for recalling Cineon image files which have rotated images.

Recall Mirror Button

Press one (or both) of the two mirror modes to enable it. The X Button causes the recalled file to be reflected horizontally. The Y Button causes the recalled file to be reflected vertically. When both the X and Y Buttons are enabled, the recalled file is flipped both horizontally and vertically. The default is both buttons off.

Recall Alpha Button

Press one of the three alpha recall modes to enable it. The default is the Use Alpha Button, which recalls the file along with its alpha channel. The Ignore Alpha Button causes the file to recalled without any alpha (transparency) - it is opaque. The Invert Alpha Button causes the file to be recalled with its alpha inverted - the file is opaque everywhere except where it has alpha. A solid object on a transparent background would be recalled as a transparent hole in the shape of the object on an opaque background.

Recall Brightness Slider

This slider is used when you are recalling images without the full brightness range available, 32 bits for Liberty 32, and 64 bits for Liberty 64. This slider's setting denotes the maximum brightness of the recalled file. Setting the slider at the top, or 255, indicates that the recalled file has 100% or normal brightness. If the recalled file has a low brightness, you set the slider correspondingly lower. The file is recalled with increased brightness. At 0 the file is recalled at maximum brightness. To use the Recall Brightness Scale in Liberty 64, you should set the "messages" button in the Canvas Panel of the Configuration Environment to 0-65535. This allows the slider to be moved throughout the full 64-bit brightness range.

OK Button

Press to confirm changes and to remove the popup.

Reset Button

Press to reset all settings to their defaults.

Cancel Button

Press to remove the popup with no changes.

Recalling Using Wildcards

When entering a file or directory name in the Recall File or File Manager Popups, you can use the * and ? wildcards anywhere in the file/directory name being entered. In such a case, the directory listing will be filtered out based on the specified wildcards. The wildcards have the following meanings: * matches 0 or more characters, while ? matches exactly one character. For example, entering "lib*.im" will list all files whose names start with "lib" with extension

".im". Entering "lib???.im" will list all files with 6 character names starting with "lib" and extension ".im". You can use wildcards in multiple places in a file/directory name for more exotic pattern matching. For example, "test*red*.???" would list all files with names starting with "test," with the string "red" in their name, and with 3 character extensions.

4.11.3 Save Button

The Save Button allows you to save images and other types of files to the disk. In the 32-bit version of Liberty, pictures are saved as 32-bit files. In the 64-bit version, pictures are saved as 64-bit files. Both versions can recall either 32-bit or 64-bit files.

To save a picture file from Canvas to the disk:

- **Press the Save Button.** The File Popup appears.
- **Type the file name you want to save the picture under, followed by the Enter key, or press on a filename in the list of filenames.** The Canvas picture is saved under the indicated file name. if you press on an existing filename you will be asked whether to overwrite it.

NOTE

If there is an active mask, only the masked area of the canvas is saved.

File Path Elevator

6 elevator boxes are provided, each of which can hold a file path. The current elevator box keeps the current path until you change it. With the Copy Prefix you can copy a path into a different elevator box, saving it for later quick access.

Save Corner Button

Press the corner button of Save when you want to use special settings to modify how pictures are saved. The Save File Popup appears (below).

When you change a save setting, it stays changed until you go back and reset it or change it again.

Save File Popup

Figure 4-59. Save File Popup

Re-scale Button

The Save Popup contains the same rescaling functions as the Recall File Popup, applied to saved files rather than recalled ones. For details on the rescale functions, see ***"Rescale Popup" on page 4-162***. When you activate Re-scale in the Save File Popup, the Save Corner Button in the Transfer panel is highlighted to indicate that Re-scale is active.

The Shrinkwrap Button

When on, the file is saved with only its bounding box, ignoring any transparent areas of the Canvas outside it.

Save Inactive Layers Button

By default only active layers in RAM are saved in a Layers File. As an option, you can save the inactive layers (in addition to those turned on) in a Layers File. You control this with the Save Inactive Layers Button in the Save Pop-up (accessed through the corner button of Save in the Transfer Panel). Press on this button to turn it on (it becomes highlighted). As long as it is on, inactive layers will be saved when you save a Layers File.

4.11.4 Save File As Button

The Save As function allows you to save the Canvas as different file formats. Press the main part of this button to save the current Canvas as a file in the current non-Liberty file format (the one displayed in the text window). Press the corner button in the Save File As Button to call up a popup that offers you a choice of foreign file formats in which to save the picture. Pressing on the center of the word in the text window also calls up the popup. Pressing on either side of the word in the text window toggles through the available file types, one by one.

To save a picture in a non-Liberty format:

- **Press the corner button of the Save File As Button.** The Save As Popup appears.
- **Press one of the file format buttons.**.
- **Press the OK Button.** The Save File Popup disappears.
- **Press the Save File As button.** The file saving menu appears.

- **Type a filename for the file to be saved under, followed by the Enter key.** Liberty saves the Canvas picture as usual, but converts it into the desired format and gives it an appropriate suffix.

NOTE

Some formats don't support alpha (transparency), which means that transparent areas of the Canvas are saved as opaque pixels of the current background color. Other formats can be saved either with or without alpha, depending on settings in their set-up menu in the Save File As Popup. Also, in the Save File As Popup, buttons for formats which currently have saving of alpha enabled have a small alpha symbol drawn next to the format name. This helps provide an additional cue as to which formats are being saved with alpha.

Save File As Popup

The Save As File Popup contains buttons for all of the available non-Liberty file formats, and also contains buttons to enable/disable compression, enable/disable shrinkwrap, enable/disable rescaling, to set up file format-specific parameters, and to specify parameters to transfer the file to a remote host via FTP.

Figure 4-60. Save File As Popup

In this table 8-bit refers to 8-bits per component, or 32-bits total (8-bits each for R, G, B, A). 16-bit refers to 16-bits per component or 64-bits total (16-bits each for R, G, B, A). **The File Buttons include**:

Table 4-2: Available non-Liberty File Formats

Format	Recall	Save
Alias	8-bit RGB or 8 bit matte	8-bit RGB
.sim	8-bit RGBA	8-bit RGBA
Aurora 280	8-bit RGBA	8-bit RGBA
BMP/DIB	1, 4, 8, 16, and 24 bit uncompressed	24 bit uncompressed
Cineon	10-bit RGB or RGBA	10-bit RGB or RGBA
DPX (SMPTE)	8, 10, 12, 16-bit RGB and RGBA	8, 10, 12, 16-bit RGB/RGBA (10, 12, & 16-bit RGB/RGBA DPX only in Liberty 64)
GIF	from 1 to 8 bits	from 1 to 8 bits
IMAGESTOR	8-BIT RGBA	8-bit RGBA
iNFiNiT!	8-bit RGBA	8-bit RGBA
JPEG	various	variable compression
PDI	8-bit RGBA block, RGBA interleave, or alpha only	8-bit RGBA interleave
PICT	8-bit RGB or RGBA	8-bit RGB or RGBA
Pixar	8-bit RGBA	8-bit RGBA
Prisms	8-bit RGBA	8-bit RGBA
Wavefront (RLA)	8- & 16-bit RGB, RGBA	8 and 16-bit RGBA (16-bit only in Liberty 64)
Scitex	-	CMY, CMYK, K (no alpha)
SGI rgb	8, 10, 12, & 16-bit RGB or RGBA	8, 10, 12, & 16-bit RGB or RGBA (10, 12, and 16-bit RGB and RGBA in Liberty 64 only)
Softimage	8-bit RGB or RGBA	8-bit RGBA
Targa (tga)	8-bit B&W, 4 or 8-bit RGB, 8-bit RGBA	8-bit RGBA

Table 4-2: Available non-Liberty File Formats

Format	Recall	Save
TDI	8- and 16-bit RGB, RGBA, or alpha	8 and 16-bit RGBA (16-bit only in Liberty 64)
TIFF	1,4,8,10,12,16-bit RGB, RGBA, CMYK, color mapped & grayscale.	1, 4, 8, and 16 bit grayscale; 4 and 8 bit color mapped; 8, 10, 12, and 16 bit RGB/RGBA; and 8, 10, 12, and 16 bit CMYK (10, 12, and 16 bit formats only available in Liberty 64).
Vertigo	8-bit RGBA	8-bit RGBA
YUV	YUV (no alpha)	YUV (no alpha)

Where multiple save options exist (like TIFF), the popup has a Set-up Button. Pressing this button brings up a Set-up Popup with different save options. **The following options exist**:

Table 4-3: Save Options by Format Type

Format	Save Options (from Set-up Pop-Up)
Cineon	Matte (alpha) enable/disable; color correction sliders
DPX	Matte (alpha) enable/disable; choose 8, 10, 12, or 16 bits; color correction sliders
IMAGESTOR	Specific type of iNFiNiT! system, and FTP transfer parameters
iNFiNiT!	Specific type of iNFiNiT! and FTP transfer parameters
RLA	Choose 8-bits or 16-bits
Scitex	Various options
SGI	Matte (alpha) enable/disable; 8, 10, 12, 16-bits
TDI	Choose 8-bits or 16-bits
TIFF	Various options
GIF	Select number of bits, dithering controls, interlace on/off, transparency
JPEG	Select compression rate
PICT	Select RGB or RGBA

As stated in the table above, a number of the file formats have Set-up menus, which are accessed by pressing the Setup button in the Save File As Popup. The Set-up menus for PICT, RLA, SGI rgb, and TDI are fairly simple, as they merely allow the user to enable/disable the saving of alpha (matte) information, and/or select the number of bits per component (8, 10, 12, or 16). The set-up menus for the other formats are more complicated. These are described in the following sections.

GIF File Format

You can save and transfer GIF images to HTML editors for inclusion on Web Pages at various levels of compression. You can set the GIF file background to transparent so that it appears as a "cut-out" when displayed by a Web browser that supports transparent GIFs.

NOTE: You may need a separate license for the GIF functions to work in Liberty. Contact your Chyron/Liberty sales representative or customer service representative.

GIF Setup Menu

Figure 4-61. Setup Menu

With the GIF Button high-lighted on the Save-As Popup, press the Setup Button to bring up the GIF Setup Menu.

Number of Bits/Pixel & Greyscale On/Off

When the greyscale button is on, the GIF file saves as a black and white image (actually, in shades of gray). In this case, the user can choose between 1, 2, 3, 4, 5, 6, 7, and 8 bits of resolution, using the corresponding buttons in the set-up menu. When the greyscale button is off, the GIF file saves as a color-mapped image (a color image that uses a color table). In this case, the user can choose between 3, 4, 5, 6, 7, and 8 bits of resolution.

Interlacing On/Off

When on, the GIF is stored with the scan lines in an order such that a World Wide Web browser can incrementally refresh the image, starting with a lower resolution version of the image and progressing to the full-resolution display.

Transparency On/Off and the Transparency Slider

When on, any pixels with an alpha of less than a certain value are flagged as transparent in the GIF file. You set the cutoff value with the Transparency Slider on the GIF Setup Menu. The higher the slider setting, the higher the opacity of the area that will appear transparent.

Uniform and Optimal Quantization

Uniform quantization splits the color space into equal partitions, while optimal quantization computes the best color table for the specific image you are saving. Optimal quantization performs very well on most images, even with very few bits per pixel.

The Dither Button

When the Dither Button is high-lighted, the quantized image is also dithered. This is the technique used in newspaper photos, where the appearance of higher color resolution is achieved by varying the density of colored dots. Dither only works with Uniform Mode.

The Noise Button

When the Noise Button is high-lighted, some noise is added to the quantized image.

This tends to smooth out color-banding artifacts that may appear at lower levels (bits-per-pixel).

Preview Button

Press the Preview Button to see how the saved GIF file will look, based on the current settings. The preview turns off when you press OK to confirm the settings, or when you press reset.

IMAGESTOR! File Format

The IMAGESTOR! functions allow you to transfer images from Liberty to the Chyron Still Store. When you enable the IMAGESTOR! Button on the Save As Popup, you can save files in IMAGESTOR! format, and optionally transfer files over the network (via FTP) to the IMAGESTOR!. When saving an IMAGESTOR file, a popup appears on which you can enter descriptive text for the file's 5 database entry fields. There is a menu in the Configuration Environment that allows you to relabel the 5 text fields when saving an IMAGESTOR! file.

IMAGESTOR! Setup Menu

Figure 4-62. IMAGESTOR! Setup Menu

With the IMAGESTOR! button high-lighted, on the Save-As popup, press the Setup Button to call up the IMAGESTOR! Setup Menu.

The IMAGESTOR! Set-up menu has three sets of text fields for user input. These are in columns, labeled "image", "image 2 (dual record)", and "FTP set-up" along the top of the menu. The text fields in each column are described in the following sections:

Image controls

These set-up transfer of the image, the thumbnail, and the update to the still store database.

- **node** **Network host name of the system that will receive the full resolution still store file (e.g.: infinit1)**
- **path** **Disk/directory path on the system where the full resolution still store file will be stored (e.g.: C/INFINIT/STILLS)**
- **Thumbnail node** **network host name of the system that will receive the thumbnail file (e.g.: infinit1)**
- **Thumbnail path** **disk/directory path on the system where the thumbnail file will be stored (e.g.: C/INFINIT/TN)**
- **Server node** **Network host name of the system that will be the database server (e.g.: infinit1). This is where the database fields (descriptive text) is sent. If this field is left blank, the database will not be updated; only the image and thumbnail will be transferred.**

Image 2 (dual record) controls

These controls allow the image to optionally be transferred to a second remote host. The image may be stored in a different directory than on the first

remote host. In addition, its address (numeric file-name) will contain an offset from the address on the first host (for example, the first remote host may have files in the range 0-500, while the second remote host may have files in the range 600-1100; the offset in this case would be 600).

In the ImageStore set-up menu, there are fields for the second remote host (labeled "image 2 (dual record)"). The fields include text windows for node name, path, and numeric offset. As in the “image” section of the menu, enter the network host name of the target system in the “node” field. Enter the disk/ directory path on the target system in the “path field”, and the numeric offset in the “offset” field. Note that if the node field of this section is left blank, a dual record will not occur (the fields in the image 2 (dual record) section of the menu will be ignored).

Note that both the first and second (dual) copies of the still will be added to the ImageStore database (for example, if the still is written as .100 to host1 and .700 to host2 (for dual record), then database entries are made for both .100 and .700). In addition, thumbnails saved for both the first and second (dual) copies of the still. Both thumbnails are transferred to the thumbnail node and path specified in the Imag-estor set-up menu.

FTP set-up controls

This section of the set-up menu contains the follow-ing fields:

- **user name**
  The name of a user account on the remote system (for infinit systems, this is often "guest").

- **password**
  The password of the user account on the remote system (for infinit systems, this is often "anonymous").

- **temp dir**
  This is the path of a temporary directory to store files on the local system. This is most often set to "/usr/tmp".

The FTP Button

Turn the 'FTP' button 'ON' if you want to automatically transfer the files and update the database over the network (from the Liberty workstation to the specified remote system(s) on the network) after saving the files to the local SGI hard disk.

Save Local Button

When you turn this button OFF, the saved image is not archived in the current directory on the local SGI hard disk after the FTP process is finished. The image is saved only in the selected directory on the selected remote system(s) on the network.

NTSC and PAL Buttons

Press one of these buttons to select either 'NTSC' or 'PAL' TV standards.

Elevator of Pre-sets

To allow the user to configure set-ups for multiple ImageStore's and Infinits, the ImageStor set-up menu has a 6-level elevator. This allows the user to set-up and save up to 6 different configurations for

ImageStore network transfer. A name is provided for each elevator level as well (immediately above the elevator itself).

When the user exits Liberty, the settings are saved and will be restored next time Liberty is started up.

If the copy prefix is on when switching elevator levels, the contents of the current elevator are copied to the new one before switching.

After filling in the fields and highlighting the appropriate buttons, confirm the IMAGESTOR! Setup menu by pressing the 'OK' button.

IMAGESTOR! Save As Popup

Figure 4-63. IMAGESTOR! Save As Popup

When IMAGESTOR! is the current File Save As Mode, first press the Save As Button, then save the file to a directory/filename path, and press Enter. At this point the IMAGESTOR! Save As Popup

appears, which provides 5 editable text fields for entering descriptive information and or/keyword parameters for the IMAGESTOR! database.

The test labels can be changed from the default labels. See "Re-label IMAGESTOR!" on page 4-188, which is a setup function found in the Directory Panel in the Configuration Environment.

Select a field to enter text into and then type the new text information. Press the Enter key to advance to the next field.

NOTE

When entering filenames to save IMAGESTOR! or iNFiNiT! images, use a four-digit numeric file name with the first number preceded by a period (e.g.: ".0032"). IMAGESTOR! and iNFiNiT! images can be saved using up to 12 alphanumeric characters (but can not start with a number - hence the leading period in numeric filenames). However, for quick on-air access, IMAGESTOR! and iNFiNiT! files are usually saved using a four-digit number as described above, because alphanumeric information requires that additional popup menus appear, thus slowing the on-air performance slightly. Note also that you can configure the IMAGESTOR! to utilize eight digit numeric file names (rather than four) if more than 10,000 stills will be utilized.

The Cancel button in the IMAGESTOR! SaveAs popup exits the pop-up menu and terminates the current Save-as operation (preventing the file from being saved/transferred). The Esc keyboard key will

also cancel the pop-up. The OK button exits the popup and saves the image (pressing the enter key in any of the text entry fields without typing new text does the same). At this point, Liberty saves the current Canvas to the specified directory on the local hard disk. A thumbnail file, with the same name as the still store file, but with the added extension .TN, will be saved to the same directory. In addition, if the set-up menu's 'FTP' button is on, the still store image, thumbnail image and database information files are transferred over the network to the selected remote system(s) on the network as indicated in the Setup Menu at this time. If the “local” button is off, the image and thumbnail files are deleted from the local hard disk once the transfer to the IMAGESTOR! is complete.

As stated, Liberty transfers the still store image, thumbnail and database information using FTP. For each file type, it uses the appropriate node name (entered in the Setup Menu) as the network host. It generates the target path on the host using the directory path (entered in the Setup Menu) and the file name (entered in the directory listing menu when the file was saved). The database server (i.e.: any infinit, Max, or Maxine connected to the network or file server) automatically and regularly 'polls' for new database files and when the database file is sent via FTP from Liberty to the database server, it automatically updates the still store database with the new information.

For the above procedure to work, both the local SGI system and the still store (host) system(s) need to have a user account named 'guest', with the password 'anonymous'. In addition, the SGI system's '/etc/hosts' file needs to contain an entry for the still store (host) system (this can also be set up using the System Manager menu in the SGI desktop

toolchest). Also, networking needs to be set up on the Still Store system itself (refer to the User Manual or Chyron Customer Support for instructions).

The Liberty software generates an FTP script to do the transfer. The script is equivalent to the following commands:

```
> ftp -in  <still store host name>
> user guest anonymous
> binary
> put <local file path> <file path on still store>
> close
> quit
```

The above commands are run for the still store (image) file, the thumbnail (.TN) file and the database information file.

ImageStore Check for Overwrite

When a file is being written to the ImageStore, Liberty queries the ImageStore database to see if the file already exists. If it does, a confirmation pop-up appears, allowing the user to either overwrite the file or cancel the operation. If the user confirms over write of the file, it will be written to the ImageStore, and the ImageStore database will be updated accordingly. This write will overwrite the old copy of the file, unless the old copy of the file was in a different location on the ImageStore (or on another ImageStore). In this case, the old copy will be deleted from that location.

The over write feature also works for dual record (transfer of the still to a second location). If dual record is enabled, and the dual still already exists on the ImageStore, the user will be prompted to overwrite or cancel.

Re-label IMAGESTOR!

Figure 4-64. Config Directory Management Illustration

In the Configuration Environment on the Directory Panel, you'll find the Re-label IMAGESTOR! Button. Press it to call up the Re-label IMAGESTOR! Popup. Press in the 5 field labels on the popup to change the labels on the IMAGESTOR! Save As popup to more meaningful names.

4.11.5 iNFiNiT! Setup Functions

The INFINIT! functions allow you to transfer images from Liberty to the Chyron iNFiNiT!, Max!, and Maxine! character generator systems. We will refer to all these systems as "infinit" in the following sections. When you enable the INFINIT! Button on the Save As Popup, you can save files in the INFINIT's RGBA message format, and optionally transfer files over the network (via FTP) to the INFINIT!.

INFINIT! Setup Menu

Figure 4-65. iNFiNiT! Setup Menu

With the INFINIT! button high-lighted, on the Save-As popup, press the Setup Button to call up the INFINIT! Setup Menu.

The INFINIT! Set-up menu has two sets of text fields for user input. These are in columns, labeled "remote system" and "FTP set-up" along the top of the menu. The text fields in each column are described in the following sections:

Remote system

These set-up transfer of the image to the infinit.

•node Network host name of the system that will receive the full resolution still store file (e.g.: infinit1)

•pathDisk/directory path on the system where image file will be stored (e.g.: C/INFINIT/STILLS)

FTP set-up controls

This section of the set-up menu contains the following fields:

•user name
The name of a user account on the remote system (for infinit systems, this is often “guest”).

•password
The password of the user account on the remote system (for infinit systems, this is often “anonymous”).

•temp dir
This is the path of a temporary directory to store files on the local system. This is most often set to “/usr/tmp”.

FTP Button

Turn the 'FTP' button 'ON' if you want to automatically transfer the files over the network (from the Liberty workstation to the infinit) after saving the files to the local hard disk.

Save Local Button

When you turn this button OFF, the saved image is not saved on the local hard disk after the FTP process is finished. The image is saved only in the selected directory on the selected infinit system.

NTSC and PAL Buttons

Press one of these buttons to select either 'NTSC' or 'PAL' TV standards.

13.5 MHZ button

This button will be on in most cases. Turn it off if you are transferring files to an old (non 13.5 MHZ infinit system).

After filling in the fields and highlighting the appropriate buttons, confirm the INFINIT! Setup menu by pressing the 'OK' button.

Elevator of Pre-sets

To allow the user to configure set-ups for multiple Infinits, the Infinit set-up menu has a 6-level elevator. This allows the user to set-up and save up to 6 different configurations for network transfer. A name is provided for each elevator level as well (immediately above the elevator itself).

When the user exits Liberty, the settings are saved and will be restored next time Liberty is started up.

If the copy prefix is on when switching elevator levels, the contents of the current elevator are copied to the new one before switching.

Saving INFINIT! Files

When INFINIT! is the current File Save As Mode, first press the Save As Button, then save the file to a directory/filename path

NOTE

When entering filenames to save iNFiNiT! images, use a four-digit numeric file name with the first number preceded by a period (e.g.: ".0032"). iNFiNiT! images can be saved using up to 12 alphanumeric characters (but can not start with a number - hence the leading period in numeric filenames). However, for quick on-air access, iNFiNiT! files are usually saved using a four-digit number as described above, because alphanumeric information requires that additional popup menus appear, thus slowing the on-air performance slightly. Note also that you can configure the INFINIT! to utilize eight digit numeric file names (rather than four) if more than 10,000 images will be utilized.

At this point, Liberty saves the current Canvas to the specified local SGI directory. In addition, if the set-up menu's 'FTP' button is on, the image, is transferred over the network to the remote infinit system as indicated in the Setup Menu. If the "local" button is off, the image is deleted from the local hard disk once the transfer to the INFINIT! is complete.

As stated, Liberty transfers the image using FTP. It uses the node name (entered in the Setup Menu) as the network host. It generates the target path on the host using the directory path (entered in the Setup Menu) and the file name (entered in the directory listing menu when the file was saved).

For the above procedure to work, both the local SGI system and the infinit (host) system(s) need to have a user account named 'guest', with the password 'anonymous'. In addition, the SGI system's '/etc/hosts' file needs to contain an entry for the infinit (host) system (this can also be set up using the System Manager menu in the SGI desktop toolchest). Also, networking needs to be set up on the infinit system itself (refer to the User Manual or Chyron Customer Support for instructions).

The Liberty software generates an FTP script to do the transfer. The script is equivalent to the following commands:

```
> ftp -in  <still store host name>
> user guest anonymous
> binary
> put <local file path> <file path on still store>
> close
> quit
```

Check for Overwrite

When a file is being transferred to the iNFiNiT!, Liberty checks the target directory to see if the file already exists. If it does, a confirmation pop-up appears, allowing the user to either overwrite the file or cancel the operation. If the user confirms over write of the file, it will be written to the iNFiNiT!. This write will overwrite the old copy of the file.

TIFF File Format

Liberty allows the user to save RGB, RGBA, CMYK, color-mapped, and greyscale TIFF files. This is selected via the TIFF setup menu (accessed

via the Setup button in the Save-As popup). This menu also allows the user to save TIFF files with inverted Y.

Note that 8-bit RGB and RGBA files are the most commonly used and widely supported formats.

NOTE: You may need a separate license for the TIFF LZW format to work in Liberty. All other TIFF formats do not require special licenses. If you need to use the TIFF LZW format, contact your Chyron/Liberty sales representative or customer service representative.

TIFF Setup Menu

Figure 4-66. TIFF Setup Menu Illustration

Save Greyscale

When activated, images are saved as 1, 4, 8, or 16-bit greyscale. 16 bit is film resolution.

Save Color-map

When activated, images are saved as 4, or 8-bit color-mapped.

The uniform, optimal, dither and noise buttons are used in color space reduction for saving greyscale and color-mapped files. These determine how the

32-bit image being saved is converted to an image with reduced color resolution. To assist in this process, the TIFF set-up menu has a Preview button. When in color-mapped or gray-scale mode, set the number of bits, and the uniform, optimal, dither, and noise buttons as desired. The Preview button then previews how this color space reduction will look, as applied to the current canvas image. The preview turns off when the TIFF set-up menu is exited. The uniform, optimal, dither, and noise buttons are further described below:

Uniform/Optimal Quantization (greyscale and color-mapped files only)

Uniform quantization splits the color space into equal partitions, while optimal quantization computes the best color table for the specific image you are saving. Optimal quantization performs very well on most images, even with very few bits per pixel.

Dither Button (greyscale and color-mapped files only)

When the Dither Button is high-lighted, the quantized image is also dithered. This is the technique used in newspaper photos, where the appearance of higher color resolution is achieved by varying the density of colored dots. Dither only works with Uniform Mode.

Noise Button (greyscale & color-mapped files only)

When the Noise Button is high-lighted, some noise is added to the quantized image.

This tends to smooth out color-banding artifacts that may appear at lower levels (bits-per-pixel).

Flip Y

When activated, saves the file from top to bottom, rather than the default bottom to top. Some applications only read TIFF files stored from top to bottom. Try this button if another application reads your TIFF files upside-down.

Other Modes

You can also save 8-bit RGB, RGBA, and CMYK TIFF files, using the appropriate buttons. Liberty 64 also allows 10, 12, and 16 bits per component. 8-bit RGB or RGBA are the most common formats for video work, whereas 16-bit RGB or RGBA would be used for film work.

To save RGB TIFF files, turn on the “Save RGB” button and turn on the “Inhibit Matte” button. To save RGBA TIFF files, turn on the “Save RGB” button and turn on the “Save Matte” button. To save CMYK TIFF files, turn on the “Save CMYK” button (the Matte buttons are ignored in this case).

When saving files in CMYK, 4 sliders are provided. These allow the user to adjust the C, M, Y, and K values after conversion from RGB when CMYK TIFF files are written, and prior to conversion to RGB when CMYK TIFF files are read. The sliders work in terms of percentages (from 0 to 200%).

JPEG File Format

The JPEG Setup Menu allows you to vary the compression or “quality” of the saved JPEG file.

JPEG Setup Menu

Figure 4-67. JPEG Setup Menu

The Quality Slider

The slider setting controls the amount of compression of the JPEG file on a scale of 0 - 100. The Reset Button resets the quality variable to a default of 75.

The Quality Slider allows you to trade off compressed file size for image quality: the higher the setting, the larger the JPEG file and the closer the output image will be to the original file. Normally, you use the lowest setting for the smallest file that will decompress into an image that looks the same as the original. Try settings between 50 and 95. If you see defects at a setting (say, 75), go up 5 or 10 at a time until the result is satisfactory. The optimal setting varies from image to image.

Settings below 50 produce very small files of low image quality. For example, you could use settings of about 5 or 10 to make an index of a large image library. A setting of 2 gives Cubist effects.

NOTE

Values below about 25 generate 2-byte quantization tables, which are considered optional in the JPEG standard. Some commercial JPEG programs may not read the resulting file.

Cineon and DPX Set-up

The Cineon and DPX Set-up Popups allow you to enable/disable saving of Matte (alpha) information. They also provide sliders for adjustment of the RGB and M black points of the image, the white point of the image, and the gamma. Increasing the sliders for the black points increases the contrast of the dark areas in the image (for red, green, blue, and matte respectively), while decreasing the white point slider value increases the contrast of the bright areas of the image. The gamma slider adjusts the mid-ranges of the image. You can adjust them depending on your particular film application. There is also a reset button to reset the sliders to defaults. The defaults convert Cineon log data to linear format during recall, and linear data back to log format during save. A Convert Off Button disables the effect of the sliders so that image data is read/written exactly as is.

This concludes the section on the Set-up menus for individual file formats. We now resume the discussion of the buttons in the File Save As popup.

Re-scale On Save

This function calls up the Re-scale Popup to allow you to re-scale the file when saving it. See page 4-162.

Press the Rescale On Button to activate it; then press the in the inset window to call up the Re-scale Popup.

Setup Button

Each file format has its own setup controls. When a file format is high-lighted on the Save As Popup, press the Setup Button to see its Setup Popup.

(Some file formats require no setup controls (for example, Prisms files are always saved as RGBA (32-bits per pixel). For such file formats, the setup button is grayed out.)

Shrink-wrap Mode Button

When on, saves only the image within its bounding box, not the transparent background. (When shrink wrap is off, the size of the saved image will be the same as the current canvas size.)

Compress Button

When on, compresses Softimage, Targa, and PDI files.

Rescale Button

This button brings up the File Rescale Popup (described on page 4-162), allowing non-Liberty files to be rescaled on output. Once the re-scale button has been set up with the desired re-scale values, use the "On" button to enable/disable re-scaling.

Save-As Orientation Button

Press one of the four orientation modes to enable it. The 90 Button causes the saved file to appear rotated 90 degrees on the Canvas. The 180 Button causes

the saved file to appear rotated 180 degrees on the Canvas. The 270 Button causes the saved file to appear rotated 270 degrees on the Canvas. The default is 0, or no rotation. This feature is very useful for saving Cineon image files which have rotated images.

Save-As Mirror Button

Press one (or both) of the two mirror modes to enable it. The X Button causes the saved file to be reflected horizontally. The Y Button causes the saved file to be reflected vertically. When both the X and Y Buttons are enabled, the saved file is flipped both horizontally and vertically. The default is both buttons off.

FTP Save As Button

When the FTP Button is enabled in the Save As Popup, the saved file is transferred to a remote directory in the current file format. For example, you could FTP Targa files to a networked PC or Mac.

All file formats in the Save As Popup, except for iNFiNiT! and ImageStor!, use the same FTP settings. If the file is a type other than iNFiNiT! or ImageStor!, pressing the FTP Button in the Save As Popup brings up the common FTP Popup.

FTP Save As Popup

Figure 4-68. The FTP Save As Popup

The FTP Save As Popup allows you to enter set-up information to log on to a remote system. If you enable FTP in the popup, the FTP Button on the Save As Popup is highlighted. Thus, you can tell if FTP is on for the current file type just by looking at the Save As Popup.

Node

Enter the node name of the remote system.

Path

Enter the path of the directory on the remote system you wish to access.

User Name

Enter the user name used to log on to the remote system. This user name must correspond to a user account on the remote system.

Password

Enter the password used to log on to the remote system. This password must correspond to the password for the user account on the remote system.

Temp Directory

Enter a temporary directory on the local hard drive where temporary files can be stored. Normally this is set to "usr/tmp," but you can specify a different location if space is tight on the "usr" drive. All files browsed or recalled via FTP pass through this temporary directory, so it needs at least a few megabytes of free space.

FTP Settings Elevator

Use the six levels of the elevator to save settings for different remote hosts/directories.

FTP/Local

If the FTP Button is on, the file is transferred via FTP to the specified remote host and directory. If the Local Button is also on, the file is saved to the local hard drive as well.

If only the FTP Button is on, the file will be deleted from the local hard disk after the FTP is completed.

Save Browse Button

When this button is on, a browse file is FTP'd along with the image, so that Liberty can later browse the file remotely.

iNFiNiT! and ImageStor! each have their own FTP settings, which are brought up by pressing either the Set-up Button or the FTP Button when iNFiNiT! or ImageStor! is the current file format. When the current file format is iNFiNiT! or Imagestor!, the FTP button highlights depending on whether FTP is turned on in the FTP settings for that file format.

Note that the enabled FTP Button on the Save As Popup causes animation files being rendered to disk in non-Liberty image file formats (as they appear in the SaveAs Popup), to be saved to a remote directory.

To prepare to save via FTP with Save As:

- 1. **Bring up the Save As Popup, chose the desired file format, and press the FTP Button.** The FTP Popup appears.
- 2. **Enter the desired settings in the FTP Popup and press on the FTP Enable Button.** The FTP Enable Button is highlighted.
- 3. **Press OK.** The FTP Popup disappears.
- 4. **Press OK on the Save As Popup.** The Save As Popup disappears.

To save via FTP with Save As:

- 1. **When the file is ready to be saved, press the main Save As Button.** The Save File Popup appears.
- 2. **Enter the file name to be saved and press <Enter.>** Liberty checks to see if the file already exists in the remote directory. If it does, you are prompted to overwrite it. When the transfer is complete, you are prompted: "FTP Transfer Complete." If the transfer fails, a red error message appears in the Prompt Window (for example if the user name or password is incorrect).

4.12 File Popup

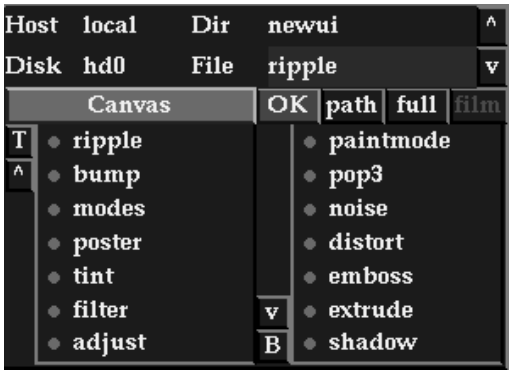

Figure 4-69. File Popup

When you press Save or Recall, this popup appears. At the top it lists the current host, disk, directory, and the last file that was saved or recalled. Below that is a list of the files in the current directory.

To initially set up the host, disk, and directory:

- **Press Save File or Recall File.** The File Popup appears. The word "Host" at the top is highlighted and the available hosts are displayed. (The host, disk, and directory must be set for both Save and Recall, and they can be set to different locations.)

- **Press on the host name you want to change to (or type in the host name and press Enter).** By convention, "local" is the default local host. After you press on the host name, the word "Disk" becomes highlighted. The available disks are displayed.

- **Press on the disk name you want to change to (or type in the disk name and press the Enter key).** After you press on the disk name (for instance, "hd0", or hard disk zero), the word "Dir" becomes highlighted. The available directories are displayed.

- **Press on the directory name you want to change to (or type in the directory name and press the Enter key).** After you press on the directory name, the word "File" becomes highlighted. The available filenames are displayed.

- **Press on the filename to save or recall, or type in the filename and press the Enter key.**

Host Button

Press on the word "Host" to choose a new host.

Disk Button

Press on the word "Disk" to choose a new disk.

Directory Button (dir)

Press on the word "Dir" to choose a new directory.

File Button

Displays the file name to operate on (usually the previous file name operated on). To change the file name you want to operate on, press on the desired file name in the file list area, or type in the filename and press the Enter key. The File Popup disappears and the operation is performed.

Plus Button (^)

When you press the Plus Button it looks for a number in the current filename, adds 1 to it, and performs the operation.

Minus Button (v)

When you press the Minus Button it looks for a number in the current filename, subtracts 1 from it, and starts the operation as if the Enter key had been pressed. When the number reaches zero, it will not go lower. The Plus and Minus buttons do not recognize negative numbers.

Use the Plus and Minus Buttons to increment and decrement filenames when saving or recalling a series of consecutively numbered files, especially when using Macros. For more information about Macros see page 4-413.

Filename list in the File Popup

The standard File Popup lists up to 10 or 14 filenames and has buttons to scroll the list up and down. Each line of the file list consists of a filename, in upper and lower case, preceded by a color "bullet" describing the type of the file. The colors of the bullets are coded to match the colored bars in the File Mode Button. (The colors also match the colored bars of the Panel Menus.)

File Mode Button

The File Mode Button is a colored bar in the File Popup labeled "Canvas" by default. It allows you to choose different options when you use Save, Recall, or another file operation. For instance, if Canvas, Temp, or Mask Mode is displayed in the colored

bar, filenames of pictures are displayed in the file list. If Font Mode is displayed in the colored bar, only filenames of fonts are displayed in the file list.

The File Mode Button controls how a file is saved/recalled, or what kind of file is saved/recalled. Pressing repeatedly on either end of the File Mode Button steps through the modes. Kinds of files that you can save/recall include Canvas, Temp, Mask, Palette, Layers, Brushes, Text, Macro, Shapes, Curves, Animation (if the Animation option for Liberty is enabled), Morph, Movie, Menu State, Diagram, Filter, Point, Font, and Corner. Pressing directly on the mode name itself calls up a the File Mode Popup that lists all the modes in their color-coded buttons.

Note that some file modes can only be accessed from certain menus. For example, Text files can only be recalled and saved from the Text Panel (section 4.20). When not recalling and saving from the Text panel, the Text mode button will normally be disabled (grayed out).

File Mode Popup

Figure 4-70. File Mode Popup

To change the File Mode when the File Popup is displayed:

- 1. Press the middle of the File Mode Button to display the File Mode Popup.
- 2. **Press one of the File Modes to choose it as the current mode.** The File Mode Popup disappears and the desired mode is displayed in the File Mode Button.

If the Mode Button displays "CANVAS" the Canvas picture will be saved, or the indicated picture file will be recalled into the Canvas.

If "TEMP" is displayed, the current Temp (the one displayed in the Transfer Buffer) will be saved, or the indicated picture file will be recalled into the

current Temp and is displayed in the Transfer Buffer. A horizontal slider is provided to change the current temp.

If "MASK" is displayed, the current mask on the Canvas will be saved, or the indicated file will be recalled onto the Canvas as a mask. See page 4-364 for step-by-step instructions about saving and recalling masks. A horizontal slider is provided to change the current mask.

If "PALETTE" is displayed, the current palette will be saved without the picture, or the palette of the indicated file will be recalled (without the picture, if any) into the Palette in the Paint Environment.

If "LAYERS" is displayed, all currently active layers and the Canvas will be saved. When you recall the file, each individual layer is recalled into its corresponding position in the stack along with all its attributes in their saved state.

Saving in Layers Mode

The Layers File Format saves the images in all active layers as well as their individual layer settings (including position, alpha, etc.) in one file on disk. The Canvas is saved in the file as well. Thus you can save the composition you are working on and come back to it later without finalizing the settings of the layers. When the Layers File is recalled, the Canvas and all layers and settings are restored from the disk. Also, when layers are recalled from disk the levels into which they are loaded are turned on even if they were off prior to the recall. Note that if there are currently fewer RAM Temps than there are layers in the recalled file, only the layers loading into current

RAM Temps are recalled. (This only happens if you've reduced the number of RAM Temps since saving the Layers File.)

Once you've selected the Layers mode as described above, using the Save Button saves the Canvas and any active layers to a Layers File. Using the Recall File Button while in Layers Mode displays any Layers Files in the directory, while you can browse Layers Files in the Full-Screen File Manager Menu. Pressing on a Layers File in the Recall Popup or Full-Screen File Manager Menu recalls the Canvas and layers from the disk.

The File Modes and their color codes are:

Table 4-4: File Modes

Item	File Mode
Canvas (magenta bar)	Save Canvas/recall to Canvas (image file)
Temp (green bar)	Save Temp/recall to Temp (image file)
Mask (yellow Bar)	Save/recall mask (image file)
Palette (light purple bar)	Save/recall palette (image file)
Layers (light blue bar)	Save/recall Layers (active layers and Canvas)
Brushes (violet bar)	Save/recall User Brush File (10 brushes)
Text (light blue bar)	save/recall text for Text Panel Menu
Macro (red bar)	Save/recall Macro in Macro Panel Menu
Shapes (teal bar)	Save/recall shape files
Curves (peach bar)	Save/recall Curve (spline data) File
Animation (purple bar)	save/recall Animation File in Animation Environment (if Liberty animation option is enabled)
Morph (magenta bar)	save/recall Morph Keyframe File
Movie (dark purple bar)	Save/recall animated preview storyboard movies
Menu State (lt. rust bar)	Save/recall menu state (with Macros)
Font (tan bar)	Save/recall Bit-stream font
Diagram (red bar)	Save/recall Diagram files
Filter (green bar)	Save/recall custom Image Filter settings
Point (dk. purple bar)	Save/recall single point motion tracking files
Corner (lt. purple bar)	Save/recall 4-corner point motion tracking files.

The Temp Elevator on the File Mode Popup

You can recall pictures into all levels of the Temp Elevator without ever leaving the File Popup.

To recall files into several levels of the Temp Elevator:

- 1. Press the Repeat Prefix Button to turn it on.
- 2. **Press Recall to display the File Popup.**
- 3. **Press the middle of the File Mode Button** (where it says "Canvas") **to display the File Mode Popup.**
- 4. **Press on a level of the Temp Elevator on the File Mode Popup.** It becomes the active elevator level.
- 5. **Press the green Temp Button to activate it.** The File Mode Popup disappears with the File Popup remaining.
- 6. **Press the filename you want to recall into the Temp.** The file is recalled into the active of the Temp Elevator. (Since the Repeat Prefix is on, the File Popup does not disappear.)
- 7. **Now, repeat steps 3 through 6 to recall files to each additional level of the Temp Elevator that you wish to recall to.**
  In this way you can load up all the Temps without ever leaving the File Popup. (This also works in the Full Screen File menu.) When finished, press Cancel to remove the File Popup.

Full-screen Button (Full)

Press to display the Full-screen File Menu. Use this button to pictorially Browse the files. Refer to the "File Manager Button" on page 4-219 for details on the full-screen File Manager menus used for browsing files.

Path Button

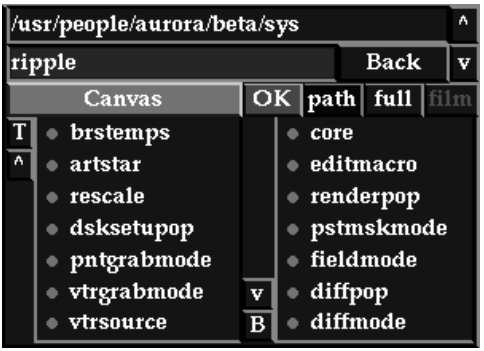

Figure 4-71. File Popup with Path Activated

Use the Path Button to access other paths besides Liberty's standard Host/Disk/Dir/File path.

To change into Path, press the button marked “path” on the File Popup. The File Popup changes to Path mode. To switch back to the standard path (Host/ Disk/Dir/File), just press the Path Button again to turn it off.

When you switch from the standard path to Path, the standard path you are in changes to Path notation (for example, usr/people/aurora/image/local/hd0/ demos/pic1) If no host was selected, "/" is displayed.

When you turn off Path, the source "image" directory is displayed.

To Use Path

When the Path first comes up, if you press on a directory name in the list of directories, the directory is added to the current path. Each time a new directory list is displayed you press on a directory to add

it to the path until you come to a filename list the end of the directory path, where you can press on a filename. The file is then recalled or saved.

In Path any time you press on a filename, the file is immediately recalled or saved.

You can use the keyboard to enter directory names and filenames instead of pressing directly on names in the list. If the File Name Button is not highlighted, press somewhere in the file list area and it will be highlighted. Then type the desired filename. The name you type appears in the File Name Button. When you press the Enter key the file is recalled or saved.

The Back Button

Press the Back Button to go back up the path one directory level. This is the equivalent of a "`cd ..`" in Unix.

When you exit the File Popup, the path that was last used is remembered. When you bring up the File Popup again, the same path is displayed.

If the maximum path length of 80 characters is ever exceeded, an error message appears, and you can choose another directory.

Full-screen File Menu

Figure 4-72. Full-screen File Menu

4.12.1 File Manager Button

Press the File Manager for a short cut to the Full-screen File Menu where you can see the files as browsed images. This is the same as pressing the Recall Button, then the Full Button. Comes up in Recall Mode by default. For more details on the Full-screen File Menu, see page 4-213.

There are two methods for recalling the Full Screen File Menu.

- Press Save File or Recall File, then press the Full button, or...
- Press the File Manager button.

Pressing Save File or Recall File brings up the standard, panel-sized File Popup. In this popup you can call up the Full-screen File Menu, which has much more detail and options, including the ability to pictorially Browse the files on disk.

On the File Popup, press the Full Screen Button (labeled "Full") to call up the Full Screen File Menu. Files may be displayed as text, like the smaller file menus, along with the size of the file (in KB) and the date/time the file was stored. Or, if the browse Button is active, files may be displayed as small "thumb-nail" or Browse pictures. The Full Screen File Menu has buttons for sorting, multiple-file selections, as well as all of Liberty's file management functions.

Scroll to Top Button (T)

Jumps the file list to the beginning of the filename list.

Scroll Up Button(^)

Scrolls the filename list up one page.

Scroll Down Button (V)

Scrolls the filename list down one page.

Scroll to Bottom Button (B)

Jumps the filename list to the end of the list.

Action Button

At the top left of the Full Screen File Menu is the Action Button, which displays the current operation you're performing: Recall, Save, Delete, etc. It allows you to choose what file management action to perform. Press on either end of the Action Button to cycle through the available actions: Recall, Save, Delete, Rename, Move, Copy, and Save As.

The Action Popup

When you press in the middle of the Action Button (right on the name of the current operation), the Action Popup appears, displaying buttons for all the action options, as well as the Save As functions. Pressing on an action button chooses that action and removes the Action Popup. Details on the Save As functions are below and on page 4-169.

Recall

When the Action Button displays RECALL, press on a Browse picture or filename in the file list, or type in a file name. The Full-screen File Menu disappears and the indicated file is recalled. As in the smaller File Popup, how the file is recalled depends on the colored File Mode Button: to the Canvas, to the Temp Buffer, as a mask, etc.

Save

When the Action Button displays SAVE, press on a Browse picture or filename in the list, or type in a new file name. The Full-screen Popup disappears and the indicated file is saved. If saving over an existing file, you are prompted to confirm the over-write. The colored File Mode Button determines how the file is saved: as a picture, as a mask, etc.

Delete

When the Action Button displays DELETE, press on a Browse picture or filename in the list. A popup appears asking you to confirm the deletion. Press yes to confirm the deletion. The Full-screen Popup disappears and the indicated file is deleted.

Figure 4-73. Action Popup

Rename

When the Action Button displays RENAME, press on a Browse picture or a filename in the list. The indicated filename appears in the Prompt Window. Type in the new name for the file and press the OK Button to confirm. The old filename is replaced by the new one and the Full-screen Popup disappears.

Move

When the Action Button displays MOVE, press on a Browse picture or filename in the list. You are prompted: "Now select a target directory." Type a directory name (or designate a path to another host/ disk/directory) for the file to be moved to.

Copy

When the Action Button displays COPY, press on a filename in the list. You are prompted: "Now select a target directory." Type in a directory name (you can also designate a path to another host/disk/directory) for the file to be copied to.

Save As

When the Action Button displays SAVE AS, the file is saved like a normal Save, but you can use the Save As functions to choose what format the file will be saved as, and what other Save As functions will be used, such as Shrink-wrap and Compress.

File Path Elevator

6 elevator boxes are provided, each of which can hold a file path. The current elevator box keeps the current path until you change it. With the Copy Prefix you can copy a path into a different elevator box, saving it for later quick access.

Select Button

The Select functions allow you to select multiple files in the file list. Press the Select Button to turn it on; then press on a filename to select it. The filename is highlighted until you perform an action on it or cancel the selection. You can select as many files as you wish, then press OK to perform the action currently displayed in the Action Button on all selected files. Press on a selected file to de-select it.

Select All Button

Press the All Button to select all the files in the current directory.

Clear Button

Press the Clear Button to de-select all the files in the current directory.

Complement Select Button

Press the Compl Button to select all files not currently selected and to de-select all files currently selected.

Page Select Button

Press the Page Button to turn it on/off. When on, the select functions work only on files on the currently displayed page.

Browse Mode

In Browse Mode picture files are displayed as small pictures. The small “thumb-nail” pictures are automatically created when pictures are saved. If pictures are imported from outside Liberty, they will usually not have Browse files associated with them and thus cannot be Browsed until the browse images

are created. The Make Browse Button is used for this. The Alpha Button activates a Browse Mode in which only the Alpha, or transparency, of each picture is displayed in white on black.

Browse Button

Press the Browse Button to turn it on/off. When on, Liberty displays "thumb-nail" pictures of the files, along with their color bullets and filenames. Pressing on a Browse picture causes its file to be selected, recalled, saved, etc. just like pressing on its filename.

Often the reason for displaying the Full Screen File Menu is to Browse pictures. If you leave the Browse Button on, it will be on the next time you call up the Full Screen File Menu.

Browse-Off Listings

When the Browse Button is turned off, Liberty displays the contents of the current directory as text descriptions of the files. There are four modes of text display, which you can access by pressing the corner button of the Browse Button, bringing up the Browse-Off Popup.

Browse-Off Popup

Figure 4-74. Browse-Off Popup

Press the corner button of the Browse Button to display the Browse Off Popup, which allows you to choose what file data display when Browse Mode is off.

List Size and Date (in Kbytes)

If the "List Size and Date" mode is on, sizes and dates of the files are displayed if possible (when accessing a remote system via FTP, the size and date information may or may not be displayed, depending on the type of remote system).

List Dimensions

If in "List Dimensions" mode, the dimensions are shown (when accessing a remote system via FTP, the file dimensions are not normally displayed).

List Image File Format

If in "List Image File Format" mode, the file format for each file is displayed (when accessing a remote system via FTP, the file format is not normally listed; it will be listed for Imagestor! files with thumbnail files in the same directory, or with entries in the Imagestor! database.)

ImageStor! Data

Once ImageStor! Data mode is enabled (when Browse is off) a row of text appears for the file name, followed by the five database fields. For non-ImageStor! files, these fields are blank. For ImageStor! files, the fields contain the database information entered when the file was saved in Liberty (or when it was entered on the ImageStor! itself). The display of the ImageStor! fields works for files on local and NFS mounted file systems, accessed through the File Manager Button. It also works for files in directories remotely displayed through the new FTP Button in the Transfer Panel (***page WA4-144***), assuming that the thumbnail files are in the same directory as the ImageStor! files, or if the name of the database server has been entered into the FTP Popup.

Alpha Button

The Alpha Button is a mode button similar to Browse. When on, it displays the files as small pictures, except that it displays their masks (their alpha values) as white silhouettes on black backgrounds. For example, a background filling up the entire screen would appear as a solid white rectangle, while an element on a transparent background would display as white on black.

Make Browse Button

The Make Browse Button is a mode button that creates browse images for foreign file formats that have been imported into Liberty. When this mode is on, Browse images for foreign files are created every time one is encountered. Creating these Browse images for large directories of foreign files can be slow (each file must be decoded and rescaled) but once the Browse image has been created it will be saved to disk and need not be recreated. A foreign file will stay with its Browse image and they will be moved, deleted, copied, and renamed together, unless you are copying from the UNIX shell, in which case both files must be dealt with explicitly. In fact, the UNIX command "ls" will not list Browse files unless the "-a" extension is used. (because the Browse filenames begin with a ".")

Sort Button

The Sort Button allows you to list files in the current directory in a variety of ways. Press the Sort Button to display a popup with a choice of sort modes. Press on one of the modes to choose it.

Sort Popup

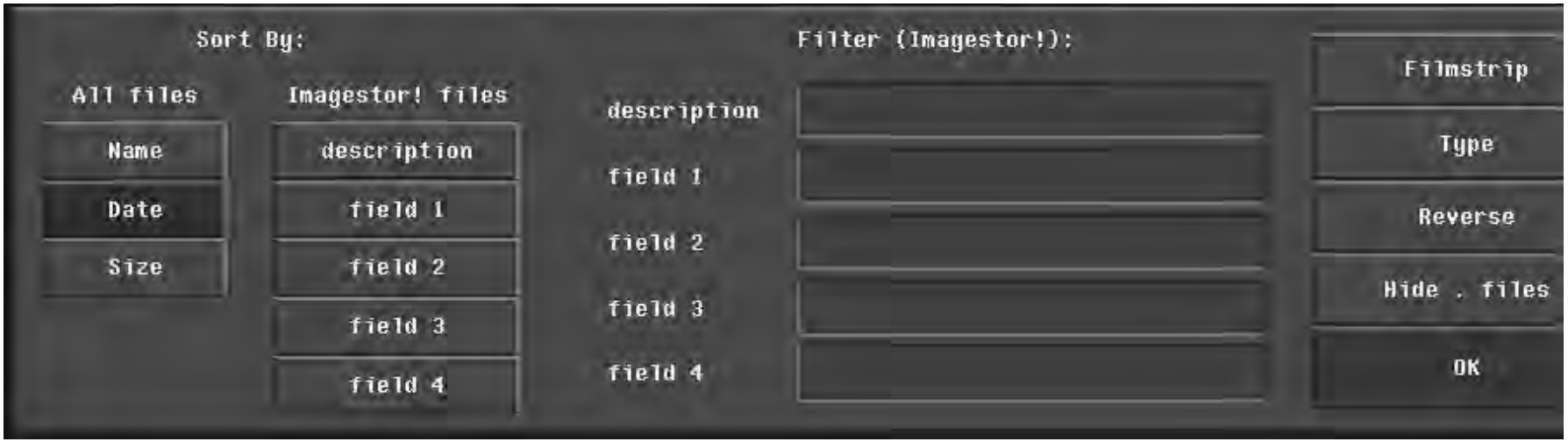

Figure 4-75. Sort Popup

The Sort Popup provides the following options for sorting the file list:

All Files

By Date List files in the order that they were created, with the newest file first.

By Name List files alphabetically. Numbers are listed correctly: X2Y comes before X11Y.

By Size List files in order of size, with the smallest file first.

ImageStor! Files

In addition to being able to display ImageStor! database fields, you can sort directory listings based on them. Five ImageStor! sort modes, labeled "description" and "field 1" through "field 4," cause the files to be sorted based on the corresponding ImageStor! database field.

Note that non-ImageStor! files are grouped together and sorted by name when one of these sort modes is active.

Other Sort Criteria

Filmstrip Lists under one Browse image all files which have identical names except for a number, (pic1, pic2, pic3, pic4...). Selecting that Browse image selects all the files of the filmstrip. Above the Browse image are six filmstrip functions. Head (H) displays the first Browse picture (i.e. pic1); Tail (T) displays the last Browse picture; the arrows "play" the filmstrip forwards and backwards smoothly or frame by frame. Note that

Raw YUV files always sort as a film-strip, since they are each one large file, playable by the filmstrip mode.

By Type Group files by type (Canvas, Select, etc.) before date, name or size.

Reverse Reverse the current sort order.

Hide . Files Causes files beginning with . (dot) to not be displayed.

Filter by ImageStor! Field

Allows you to filter the current directory listing based on the ImageStor! database fields of its files by the use of the five text entry windows, one for each database field, in which you can enter text and wildcards.

When a window is blank, filtering is not done based on the corresponding database field. When a window contains text, only the ImageStor! files whose database fields match the text in the window are listed in the directory listing. For example, if the field 1 window contains the word "people," only ImageStor! files with “people” as database field 1 are listed.

You can also use wildcards in the five filter fields. The wildcards have the following meanings: * matches any number of characters, while ? matches exactly one character. For example, entering "lib*" lists all files whose corresponding database field starts with the characters "lib" ("liberty," "liberation", etc.). Entering "lib????" lists all files whose corresponding database field entries start with the characters "lib" and contain 7 characters exactly.

You can use wildcards in multiple places in a text window for more exotic pattern matching. For example, entering "test*red*???" would list all files whose corresponding database field starts with "test" and contains the word "red" followed by at least 3 more characters.OK Button

Press the OK Button to remove the Sort Popup.

Free Space Display

Shows the total free space on the disk in KB. *The value could be 0 for some remote hosts that do not report disk capacity.*

Total Selected Display

If a number of files are selected, shows the number of selected files and the total size in KB. Very useful when you need to delete files to free up a specific amount of space on the disk.

Prefix Buttons

The following standard prefix buttons are included in the Full-screen File Menu: **Rep, Und, Add**, and **Inv.** These work the same here as on the standard Paint Environment menu.

OK Button

Press the green OK button to start the current action on the selected files. If there is no selection, do not press OK; just hit the Enter key after typing in the filename, or press directly on a filename in the list. If there is a selection, OK must be used. Also OK must be used when choosing a directory while in Path mode (for example, when choosing a directory to copy a file to.)

Cancel Button

Press the yellow Cancel button to remove the Full-screen File Menu without performing any action.

Loading Layers Graphically

Figure 4-76. Full-Screen File Manager (with Temp Loader)

The most convenient way to load up a number of Temp Buffers with images from the disk is to graphically load them from the Full-Screen File Menu.

To load layers graphically:

- 1. **Press the File Manager Button on the Transfer Panel.** The Full-Screen File Menu appears.
- 2. **Press the right end of the pink Canvas File Mode Button to change it to Temp**. The Temp Browse Menu appears across the bottom of the screen.
- 3. **Press on the browse image you want to load into a Temp.** It becomes highlighted.
- 4. **Press on the Temp browse window you want to load into**. The chosen browse image appears in the indicated Temp browse window.
- 5. Repeat for as many pictures as you want.
- 6. **Press Cancel to remove the Full-Screen File Menu.** Pressing OK also loads the last browse image to the current Temp.

Loading masks graphically works in a similar fashion except that in Step 2 you switch the colored File Type Button to "Mask".

4.13 PAINT PANEL

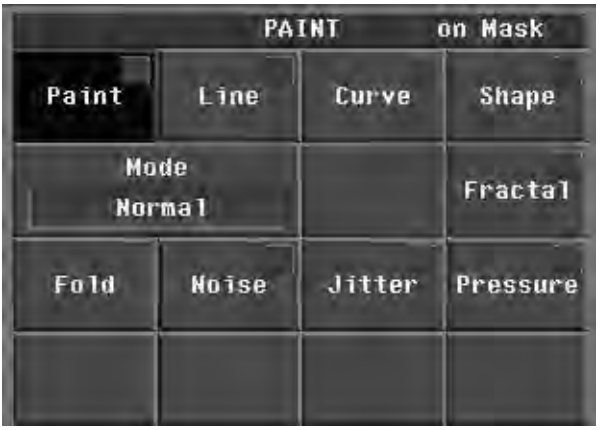

Figure 4-77. Paint Panel

All Liberty's painting functions are on the Paint Panel. The top line of buttons on the Paint Panel (Paint, Line, Curve, and Shape) all start a painting operation. The other buttons on the Paint Panel Menu are mode buttons that modify how painting, line drawing, curve or shape drawing is performed.

Painting to Temps and Masks

At the top of the Paint Panel is a bar where you can chose different Paint Modes - On Canvas for normal painting on the Canvas, On Temp for painting to the current layer, and On Mask for painting into masks.

When Paint On Temp Mode is active, all paint functions apply to the current Temp layer, and only works if the current Temp is an active layer (that is, if it is displayed as a layer on the Canvas). Paint functions that need the current Temp as a source image, such as Reveal Paint, are disabled.

When Paint is off, pressing on a layer on the Canvas makes that layer the current layer. This is a quick way to select a layer for Painting or for applying Image Tools.

You can change brush, color, transparency, and paint mode during painting. The Grid and Direction functions (the Direction Button, the Horizontal Button, and the Vertical Button) constrain painting and line/curve drawing. If a mask is active on the Canvas, painting or line/curve drawing only affects the masked area.

When painting to the Canvas, the **under** prefix button when used with Paint, Line, Curve, and Shape causes these functions to paint under the picture on the Canvas. While painting or line/curve/shape drawing, the Under Prefix can be turned on or off at any time.

When painting to Canvas, you can erase from the Canvas by painting with no palette color selected.

When painting to Mask, the Invert Prefix button causes the paint functions to erase from the current mask (rather than adding to it.)

NOTE

If the Mask is active and you turn on Paint (while in Paint on Mask mode), the mask becomes visible and you can add to it or erase from it with the brush. If the mask is not active and you turn on Paint (while in Paint on Mask mode) the mask is erased before it becomes visible and painting can begin.

4.13.1 Painting Functions

Paint Button

Press the Paint Button to paint using the current brush, color, transparency, and paint mode. The brush appears on the Canvas controlled by the mouse or the pen. Press down to paint. Pressure-sensitive painting is supported if you are using a pressure-sensitive tablet; see Pressure-sensitive Mode below. Press the Paint Button again to turn it off.

Line Button

Press the Line Button to draw straight lines using the current brush, color, transparency, and paint mode. Press down once to start the line and press a second time to complete the line. To "break" the line, press the button on the barrel of the pen, or use the middle or right mouse button. Press the Line Draw Button again to turn it off.

Curve Button

Press the Curve Button to call up the Curve Popup. It allows you to draw curves using the current brush, color, transparency, and paint mode. For a detailed description of the Curve Popup functions, see "Curve Popup" on page 4-248.

Shape Button

Press the Shape Button to call up the Shape Popup. It allows you to create shapes and render them, or outline them using the current brush, color, transparency, and paint mode. For a detailed description of the Shape Popup functions, see page 4-262.

Paint Gap Popup

Figure 4-78. Paint Gap Popup

Use this popup to adjust the gap between "pen-downs" as you paint, so that you can paint, for instance, with dotted lines. Press the corner button of Paint to call up the Paint Gap Popup. When you drag your pen across the tablet, the tablet cannot get new coordinates constantly; there is a gap between tablet coordinates which increases with the speed of the moving pen. By default, Liberty fills in the gaps while you paint. The Paint Gap Popup controls how, or whether, the spaces between tablet coordinates are filled while painting.

The Gap Slider

This slider on the Paint Gap Popup controls the paint gap expressed in percentage of the diameter of the brush. Works in either Max or Exact Mode (see below). The scale is from 1 to 300. At 100 the brushes are placed edge-to-edge. At settings of more than 100 there is a gap between brushes. At less than 100 the brushes overlap. The Gap Slider is also on the Line Gap and Curve Gap Popups.

To change the Paint Gap:

- **Press the corner button of the Paint Button.** The Paint Gap Popup appears.
- **Press and drag the Gap Slider on the Paint Gap Popup.**
- **Press the OK Button.** Proceed with painting.

The Paint Gap Modes

There are three mode buttons on the Paint Gap Popup: Max, Exact, and Nofill. Press on one of them to turn on the corresponding Paint Gap Mode. The Paint Gap Modes control the way Liberty interprets your moving pen when painting. The Exact paint gap mode is the most commonly used one. It is the default, and results in the fastest brush speeds.

Max Mode

In Max Mode, there is no filling between tablet coordinates as long as the gap between them does not exceed the value on the Paint Gap Slider. If the gap between the tablet coordinates exceeds the value on the Gap Slider, a straight line is drawn between the tablet coordinates, using the value on the Gap Slider. Thus, the maximum gap between the brush "pen-downs" will be whatever the value on the Paint Gap Slider is set to.

Exact Mode

In Exact Mode, Liberty places brushes exactly at equal distances according to the setting of the slider. Liberty will not allow brushes to be placed any closer without lifting the pen and pressing again. The Line and Curve Gap Popup always use Exact mode and thus do not have the Max, Exact, and Nofill Buttons.

Nofill Mode

In Nofill Mode, Liberty places the brush without filling and ignores the slider value. The density of the "dotted" line varies with painting speed.

OK Button

Press to confirm the gap setting and remove the Gap Popup.

The Reset Button

Press to reset the Gap Slider to the default 26% and turn on Exact Mode.

Curve and Shape Gap Popup

Figure 4-79. Curve and Shape Gap Popup

These popups are identical to the Paint Gap Popup, except they do not have the Max, Exact, and Nofill mode buttons. Curve and Shape have no tablet coordinates to interpret, and they always operate in Exact mode. *The default on the Line/Curve Gap Slider is 15%.*

Line Gap Modes

Figure 4-80. Line Gap Popup

The Line Gap Popup contains a slider for setting the line gap (the gap between brushes painted along a line). In addition, the Line Gap popup contains three mode buttons: Single, Multiple, and Radiate. In Multiple Mode, as you repeatedly press on the Canvas, the corresponding points are connected with lines using the current brush.

In Single Mode, one press starts a line and the second press terminates it. The next time you press a new line is started.

In Radiate Mode, the first press defines a center point. Subsequent presses cause lines to be painted from the center point to the points pressed (in other words, the lines radiate out from the center point). You can use the button on the barrel of the pen (or the middle mouse button) to reset line painting (for example, to start a new sequence of lines while in Multiple Mode).

4.13.2 Curve Popup

Curve Paint gives you a popup that allows you to create and edit curves (splines) by adding curve points to the Canvas. When you press OK, a curve is drawn through the points, using the current brush, color, and transparency setting.

To create a simple curve drawing:

- **Press the Curve Button.** The Curve Popup appears. If a curve appears on the Canvas, press the Erase button on the Curve Popup to clear it.
- **Press the Add Points Button on the Curve Popup.**
- **Press on various places in the Canvas to add curve points.** Liberty displays a spline curve through the points as you put them down.
- **Press the green OK Button on the Curve Popup.** The current brush in the current color and transparency is dragged along your curve to create a curve drawing.

Figure 4-81. Curve Popup

The Curve Popup contains a large array of functions for creating and editing curves. The Curve functions are also used in Liberty's optional animation software to create and edit motion paths. Press the Curve Button to call up the Curve Popup.

Curve Points

You create a curve by putting curve points on the Canvas with the Add Points Button. One curve is active at any time. You can store curves in the Curve Elevator or Save them to the disk. Curve

points are represented on the Canvas by little white dots. The Curve is represented by a red line. The Curve Popup has the same functions as the Path Popup for creating curve paths for animation actors in Liberty's Animation Option.

Curve Tangents

Each curve point (except the first and last points in the curve) has two tangents, which define how the curve approaches and leaves the curve point. Tangents are represented by a yellow line. You can use the Move Points Button (see **page 4-251**) to drag the end points of the tangents, thereby changing how the curve approaches or leaves a point. Normally the two tangents for each point are locked together in a straight line; so that moving the end point of a tangent affects the other end. You can use the Break Button (see **page 4-253**) to separate the tangents of a point and modify each tangent independently of the other.

Curve Elevator

Press one of the Curve Elevator buttons to display the points of the curve in that elevator level for editing. You can store a curve on each of the 8 levels of the Curve Elevator. Use the Copy Prefix to copy a curve from one level to another.

Select Points Functions

Most of the functions on the Curve Popup act on selected points. The Select Points functions are in the vertical row of buttons at the right of the Curve Elevator. They provide tools to select multiple points so you can edit points as a group.

Select Points Button

To select curve points:

- **Press the Select button (labeled Selct) to turn Select Points Mode on.**

- **Press on or near each curve point on the Canvas you want to select.** Each selected point turns red. Pressing on an already selected point de-selects it.

Clear Select Points Button

Press the Clear button to deselect all points.

Complement Select Points Button

Press the Compl button to select all unselected points and deselect all selected points. When no points are selected, press it to select all points.

Previous Select Points Button

When a selection of points has been turned off, press the Prev button to re-select the last selection.

Shift Select Points Button

This button shifts the selected points. Press the left side of the button to shift backwards, or press the right side of the button to shift forwards.

NOTE

The Xform Button below the Shift Select Points Button is used to move the rotational axis of the points and is discussed below.

Add Points Button

To add curve points on the Canvas:

- **Press the Add Button.** The cursor appears.
- **Press on the Canvas at each position where you want to deposit a point.** A spline is displayed through the points as you put them down. If there are already curve points on the Canvas, the line changes to reflect each added point.

Move Points Button

To move one at a time:

- **With no points selected, press the Move Button.** Tangents of the points appear on the Canvas represented by white lines.
- **Position the cursor over a point or over a tangent end-point.**
- **Press and drag the point or tangent end point to its desired position.** The curve changes as you move the point. *Move as many points as you like.*

To move groups of selected points:

- **Select some curve points.**
- **Press the Move Button.** Tangents are not displayed when points are selected. Tangents cannot be moved as a group.
- **Press and drag the selected points as a group.**

Delete Points Button

To delete points one at a time:

- **With no points selected, press the Del button.**

- **Position the cursor over a point, and press down.** The point is deleted. The curved line changes to reflect the deletion. You may delete as many points as you like.

To delete groups of points:

- **Select the points to be deleted.**

- **Press the Del button.** The selected points disappear.

Paint Points Button

To "paint" with points:

- **Press the Paint Button.**

- **On the Canvas press and drag the cursor to "paint" the desired curve on the Canvas.** Points are laid down following the curve you draw manually. Then use the Add, Move, and Delete buttons to refine the curve, if necessary.

Insert Point Button

The Insert Points (Insrt) button allows you to insert points along the curve.

To insert points in an existing curve:

- **Press the Ins button**.

- **Press on the curve where you want the new point to appear**. The point is added and the curve is modified.

Duplicate Points Button

The Dup button allows you to exactly duplicate a point at a particular position on the curve. This is most useful when creating paths in the Animation Environment (see below).

To duplicate a point using the Duplicate Points Button:

- **Press the Dup button in the Curve Popup**. It becomes highlighted.

- **On the Canvas, press on a point in the curve.** Another point is added exactly on top of the point you pressed. You can now move the new point to a new location on the curve.

Duplicated points are colored the same color as the tangent lines (default is yellow) to distinguish them from single points.

When the Duplicate Points Button is enabled and you move the cursor near a point, the point you are nearest to will flash, as a preview of which point will be duplicated when you press down. Duplicate points can be used to make animation holds in Liberty's Animation Option.

Close Curve Button

Press to turn on or off. When on, the first and last points in the curve are connected so that the curve is closed.

Break Button

Each point in the curve has two tangents, represented on the screen by straight yellow lines through the point. Normally the two tangents for each point are locked together in a single line. The Break Button breaks the two tangents apart so each can be changed independently of the other. This allows the curve to take a sharp angle as it goes through the point.

To break tangents:

- **Select a point, or points, whose tangents you want to break.**
- **Press the Break Button.** The tangents change from a solid white line to one solid and one broken line.
- **Clear the Select.**
- **Use the Move Button to move the tangents independently of each other.**

Join Button

After you have broken a point's tangents, use Join to re-join them. It works the same as Break Points, though it performs the opposite operation.

To join tangents that have been separated:

- **Press the Select Points Button and select the point(s) you want to join.**
- **Press the Join Button.** The tangents of the selected points are joined again.

Recall Points Button

Press the Recall button to display the File Popup and recall curves that have been saved on the disk. Type in the filename of the curve you want to recall, or find the filename in the list and press on it. The recalled curve replaces the current curve.

Save Points Button

Press the Save button to display the File Popup and save the current curve to disk. You are prompted to enter a filename for the curve you are saving. The actual points and tangents of the curve are saved, not the image that is created when you press OK.

Erase Points Button

Press the Erase button to delete all points on the Canvas. It doesn't matter if the points are selected or not.

Curve OK and Cancel Buttons

Press the OK button to draw the current curve, using the current brush, color, and transparency. Unless the Repeat Prefix is on, the Curve Popup disappears. Press Cancel to remove the popup without drawing the curve.

Curve Palette Button

Press the Palette button to call up the color palette and color slider scales without exiting the Curve Popup. Press OK to return to the Curve Popup.

Gravity Button

Press the Grav button to turn on Gravity, which allows you to add a point exactly on top of another point. This is useful when creating curves which cross themselves (such as bows, etc.) The Grav button is grayed out unless you are in the Add or Move Points mode.

To add a point exactly on top of an existing point:

- **Press the Add Button.**
- **Press the Gravity Button to turn it on.**
- **Move the cursor near a point on the Canvas.** It lights up. The lighted point is the one over which the added point will go.
- **Press down.** Gravity causes the added point to go exactly on top of the lighted (nearest) point.

The Move Gravity Function

Move Gravity combines the Gravity Button and the Move Points Button. When the Gravity Button is on, the Move Button will snap the point being moved to any point it gets close to. This allows you to lock curve points together after the points have been added. Thus two existing points can be made into duplicates.

Transform Points Functions

The upper part of the Curve Popup Menu contains buttons for 3D rotation, scaling, and other transformations of curve points.

Transform Axis Button (xform)

This button works in conjunction with the Move Points button. Turn on the Transform button, then turn on Move. The center of rotation is displayed as a small cross. Press on the Canvas to move the cross. All subsequent rotations will use this point as their center.

Scale Points Button

To scale curve points:

- **Select some points in the curve.**
- **Press the Scale button.**
- **Press and drag the pen up and down the Canvas.** This causes the selected points to be scaled up or down. The curve changes as the points are scaled.

Center Points Button

Press the Cent button to center the selected points around the transform axis.

Polygon Button

Press the Poly button to cause the selected points to form a regular polygon. Three selected points become an equilateral triangle; four selected points become a square. Five selected points become a regular pentagon; and so on. At the same time, the tension of the curve is reduced to zero, making straight lines between points. The curve changes as the points take on the new arrangement.

X Rotate Points Button

To rotate curve points around the x axis:

- **Select some points in the curve.**
- **Press the Rot X button.**
- **Press and drag up and down on the Canvas**. The curve changes as the points are rotated.

Y Rotate Points Button

To rotate curve points around the y axis:

- **Select some points in the curve.**
- **Press the Rot Y button.**
- **Press and drag up and down on the Canvas.** The curve changes as the points are rotated.

Z Rotate Points Button

To rotate curve points around the z axis:

- **Select some points in the curve.**
- **Press the Rot Z button.**
- **Press and drag up and down on the Canvas.** The curve changes as the points are rotated.

Bias Button

To change the bias:

- **Select some points in the curve.**
- **Press the Bias Button.**
- **Press and drag up and down on the Canvas.** The curve changes as the bias of the points changes.

About Bias

Like tension, Bias acts on each selected point in the curve. When moving the cursor upward, bias increases the length of a selected point's out-going tangent. At the same time, it proportionately decreases the length of the next point's tangent. This

has the effect of making the curve joining the two points 'curvier' at the beginning and straighter at the end.

Likewise, moving the cursor down has the effect of making the curve straighter at the beginning and 'curvier' at the end. As with Tension, however, the angles of the tangents matter also. If the tangents point at each other, the curve will not get very 'curvy' (no matter how long the tangents become).

Tension Button

To change the tension:

- **Select some points in the curve.**
- **Press the Tens button.**
- **Press and drag up and down on the Canvas.** The curve changes as the tension of the points changes.

About Tension

For each selected point, Tension uniformly increases or decreases both tangents of the point. This change is based on the Y movement of your cursor (moving up makes the tangents longer, while moving down makes the tangents shorter).

The idea is that making the tangents longer should have the effect of making the curve 'curvier', while shrinking them should have the effect of making the curve straighter (more 'Tense'). Whether or not Tension actually does this, however, also depends on the angles of the tangents. If the tangents of two adjacent curve points, for example, point straight at each other directionally, then increasing their length

doesn't make the curve 'curvier' at all. The tangents have to be angled somewhat away from each other for the curve to get 'curvier'.

Resolution Button

Press the Resol button to display the current resolution of the curve. Default is 35 line segments between points. Type in a new number to change the resolution. Typing "1" gives straight lines between the points.

Reverse Points Button

The Rev button reverses the order of two selected points.

To reverse the order of two points:

- **Select the points to be swapped.** Select just the two points to be swapped.

- **Press the Rev Button to swap the order of the two selected points.** The curve display adjusts to follow the new order.

Point List Button

The Point List Button is only enabled if you have Liberty's Animation Option. When editing an Animation actor's path (using the Edit Path button in the actor edit menu), press the Point List button to recall a Point File.

Point Files are created with the Motion Tracking function in the Image Tools2 panel, when the tracking function is in Point mode (tracking a single point in the image). The Point File is read in as a curve to be used as a path in the animation actor. For exam-

ple, recalling a Point File while editing a Cel Actor's path makes the actor's image follow the path defined in the Point File, as defined for each frame.

Corner List Button

The Corner List Button is only enabled if you have Liberty's Animation Option. When editing an Animation actor's path (using the Edit Path button in the actor edit menu), press the Corner List button to recall a Corner File. Corner Files are created with the Motion Tracking function in the Image Tools2 panel, when the tracking function is in Corner mode (tracking four corner points).

The Corner File is utilized to apply corner warping to an animation actor. For example, recalling a Corner File while editing a Cel Actor's path puts the cel actor's keyframes in Distort/Warp mode, and warps the cel actor's image using the four corner points defined in the Corner File for each frame.

4.13.3 Shape Popup

Figure 4-82. Shape Popup

The Shape Button calls up the Shape Popup, which is used to create simple wireframe shapes to be rendered as a solid in the current color or as an outline with the current brush.

Circle Button

To create a circle:

- **Press the Circle Button**.
- **Press on the Canvas.** The place you press becomes the center of the circle.

- **Move the pen outwards, without losing contact with the tablet.** The circle grows as you drag away from the center.
- **Lift the pen when the circle is the right size.**
- **Press the Fill Button or the Outline Button to render the shape.**

Ellipse Button

To create an ellipse:

- **Press the Ellipse Button**.
- **Press on the Canvas.** The place you press becomes the center of the ellipse.
- **Move the pen outwards, without losing contact with the tablet.** The ellipse grows as you drag away from the center. The more you move the pen horizontally, the more the ellipse grows horizontally; the more you move the pen vertically, the more the ellipse grows vertically.
- **Lift the pen when the ellipse is the right size and shape.**
- **Press the Fill Button or the Outline Button to render the shape.**

Square Button

To create a square:

- **Press the Square Button**.
- **Press on the Canvas.** The place you press becomes the corner of the square.
- **Move the pen outwards, without losing contact with the tablet.** The square grows as you drag away from the corner.

- **Lift the pen when the square is the right size.**
- **Press the Fill Button or the Outline Button to render the shape.**

Rectangle Button

To create a rectangle:

- **Press the Rectangle Button**.
- **Press on the Canvas.** The place you press becomes the corner of the rectangle.
- **Move the pen outwards, without losing contact with the tablet.** You are dragging the opposite corner of the rectangle.
- **Lift the pen when the rectangle is the right size and shape.**
- **Press the Fill Button or the Outline Button to render the shape.**

Triangle Button

To create an equilateral triangle:

- **Press the Triangle button.**
- **Press on the Canvas.** The place you press becomes the center of the triangle.
- **Move the pen outwards, without losing contact with the tablet.** The triangle grows as you pull away from the center.
- **Lift the pen when the triangle is the right size.**
- **Press the Fill Button or the Outline Button to render the shape.**

Star Button

To create a star:

- **Press the Star button.**
- **Press on the Canvas.** The place you press becomes the center of the star.
- **Move the pen outwards, without losing contact with the tablet.** The star grows as you pull away from the center.
- **Lift the pen when the star is the right size.**
- **Press the Fill Button or the Outline Button to render the shape.**

Polygon Button

To create an irregular polygon:

- **Press the Poly Button.** It lights up.
- **Press the Polygon Window until it displays "Add."**
- **Press repeatedly on the Canvas to add points.** Each point is connected to the previous point by a straight line, forming a closed polygon.
  By pressing repeatedly on the Poly Button, you can cycle through the four different Poly Functions: Draw, Add, Delete, and Move. Draw allows you to add points to the polygon. New points are always added at the end of the polygon (i.e. after the last point in the polygon). Add allows you to add points to the polygon; however it differs from Draw in that new points are added between the two Polygon points closest to the cursor. Move allows you to move the existing points by pressing and dragging on them. Delete allows you to delete points by pressing on or near them.

- **Press the Fill Button or the Outline Button to render the shape.**

The Polygon Button stays on as long as you are editing the polygon. Creating another shape erases the existing polygon. To create another shape without erasing the existing shape, use a different elevator level.

Erase Button

Deletes the current shape.

Center Button

The Center Button positions the center of the current shape at the center of the Canvas.

Move Button

To move the current shape:

- **Press the Move button.**

- **Press on the shape and drag it to its new position.**

Transform Shape Button (Trans)

Press the Trans button to call up the Transform Popup which is used for rotating, scaling, slanting, and mirroring the current shape. All functions work similarly to those on the Paste Distort Popup.

Figure 4-83. Transform Shape Popup

Shape Gradation Button

Fills the current shape with a gradated mask, similar to Gradated Rectangle Mask (see page 4-367). The Direction Button controls the direction of the Gradation (see page 4-59). The corner button calls up the Diagram, which you can use to distribute the gradation in non-linear ways. Note that the Gradation button only works when using shapes to create masks (i.e. when the Paint panel is set to paint on Mask).

Shape Fill Button

Renders the current shape as a solid in the current color, transparency, and size.

Shape Outline Button

Draws an outline of the current shape using the current brush, in the current color and transparency.

Shapes Popup Cancel Button

Closes the Shapes Popup Menu.

Shape Palette Button

Brings up the Color Palette and enables you to change the palette colors, underlining the one you want the current shape to render in. Press the OK Button to return to the Shapes Popup.

Recall Shape and Save Shape Buttons

Used to recall and save shape files. This does not save or recall the rendered picture of the shape, but the wireframe only, as well as any settings that have been changed from the defaults.

Shape Elevator

Creating a new shape erases whatever current shape is displayed on the Canvas. To create a new shape without erasing the current one, you must use a different elevator level. There are seven elevator levels, each of which can hold one shape. Press on the level you want to edit. It becomes the active elevator level, and the shape contained in it is displayed for editing or rendering. Use the Copy Button to copy a shape to a different elevator level.

Shapes Inbetweening

Figure 4-84. Shapes Inbetweening Area

The Shapes Inbetweening section at the top of the Shapes Popup is used to create intermediate "key-frames" of shapes between shapes that you create using the standard Shapes tools. Thus, for instance, you could create a triangle and a star at two different keyframes and, using in-betweening, create a shape that is between a triangle and a star.

To activate Shapes Inbetweening, press on the Shapes Inbetweening Button at the top of the Shapes Popup.

Shapes Inbetweening Timeline

This timeline is similar to the Morph Timeline. You can add, delete, and copy keyframes or shapes along the length of the Timeline. Controls are also provided to manipulate the points in a shape, so you can adjust how one shape changes into another.

Press and drag the slider pointer at the bottom of the Timeline to move it along the Timeline.

The Next/Previous Buttons (< >)

Press either of these buttons to move to the next or previous keyframe on the Timeline.

The Add Keyframe Button (Add Kf)

To add a keyframe/shape to the Timeline:

- **Move the Timeline slider to the place where you want to add the keyframe.**
- **Create a shape on the Canvas, using the normal Shape tools.**
- **Press the Add Kf Button.** A keyframe of the current shape is added. A keyframe marker appears at that place on the Timeline.

Once you've added the keyframe, you can change the shape on the Canvas, but the contents of the keyframe will not change. Use the Replace Kf Button to update the shape in an existing keyframe. To display the shape in an existing keyframe on the Canvas, just move the Timeline marker to the desired keyframe and its shape appears on the Canvas. (Note that if the Timeline marker is right on a keyframe, the shape is drawn in white. If the marker is between keyframes, the shape is drawn in red.)

You can press right on a keyframe's marker on the timeline to go directly to it.

The Delete Keyframe Button (Del Kf)

To delete an existing keyframe, move the marker to the keyframe you want to delete and press the Del Kf Button.

Copy Keyframe Button (Copy Kf)

To copy a keyframe to a new place on the Timeline, move the marker to the keyframe you want to copy, press the Copy Kf Button, and then click on the Timeline at the desired location of the copied keyframe. This is useful when you have created an in-between keyframe and want to put it somewhere else on the Timeline.

About Shape Points - The Link Keyframe Button (Link Kf)

The Link Keyframe Button allows you to control how a shape's points change between keyframes. For example, when creating a keyframe between two shapes with the same number of points, Liberty makes its best guess as to how the points should correspond in the new keyframe. The Link Keyframe Button allows you to adjust which points in the first shape correspond to which points in the second shape.

Internally each shape's points have a certain order, and each shape has a start point. When you choose a keyframe (using the slider or the </> Buttons on the Inbetween Timeline), the start point is red. The rest of the points in the shape are ordered in either a clockwise or counter-clockwise direction. The second point (one point either clockwise or counter-clockwise from the start point) is yellow, which helps you visualize how the points are ordered.

When a shape in-betweens to another shape, the points are interpolated based on their order. The start point of the first shape in-betweens to the start point of the second shape, while the second point of the first shape in-betweens to the second point of the second shape, and so on for all the points. Press the arrow buttons (</>) on either end of the Link Key-

frame Button to cycle the order of the points in the current shape. You can tell which way they're cycling by watching how the red (start) point moves. You can also change the order to either clockwise or counter clock-wise by pressing the labeled Link Window Button till it displays the desired direction, then pressing on the main part of the Link Keyframe Button.

To get the best in-betweening results with the least amount of folding and cross-over, place the start points of the two neighboring keyframes in the same relative position (for example, at the bottom of the shapes) and make the direction of the order the same (clockwise or counter-clockwise), and then press on the main part of Link Keyframe Button.

Move Keyframe Points Buttons (Move Prev Kf pt/Move Next Kf pt)

Use these buttons when the two shapes to be in-betweened have a different number of points. For example, if the first shape has three points and the second shape has five points, the second shape's two extra points have to originate somewhere in the first shape. Often the second shape's extra points originate from the same point on the first shape. You can change how these points originate in the following way:

To change the origin position of extra points (from a triangle to a star):

- **Use the Triangle Button to create a triangle shape.**

- **Move the Timeline marker to the beginning of the Timeline.**

- **Press Add Kf.** A new keyframe appears (the triangle) at the beginning of the Timeline.
- **Move the Timeline marker to the end of the Timeline.**
- **Use the Star Button to create a star shape.**
- **Press Add Kf.** A new keyframe appears (the star) at the end of the Timeline.
- **Move the marker back to the first keyframe.** This selects the first keyframe (the triangle).
- **Press the Move Next Kf pt Button.** The point on the triangle where multiple points originate turns blue. In this case, it's the lower-left point of the triangle.
- **Press and drag the seven multiple points out of the blue point.** As long as multiple points remain, the point stays blue. You can drag the points (one at a time) past other points in the shape to distribute them evenly, two points to a side. Note that the points turn green as you move them.
- **Move the Timeline marker back and forth between the two keyframes to see the in-betweening.**

When the second shape has fewer points than the first shape, the procedure is the same, except that you choose the second keyframe and use the Move Prev Kf pt Button.

See the Shapes Actor section in the Animation Environment, page 4-186, for details about how to animate shapes in-betweening.

4.13.4 Paint Mode Button

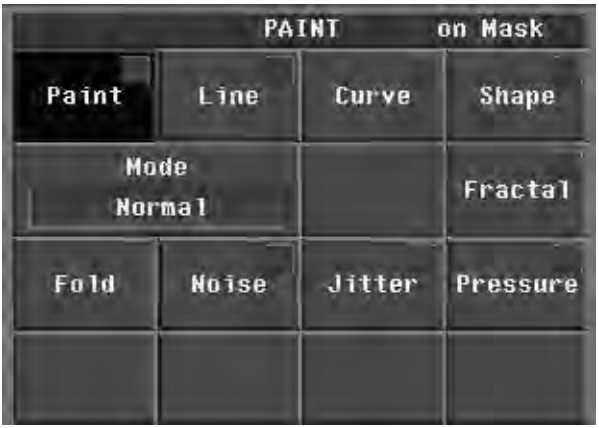

Figure 4-85. Paint Panel

The Paint Mode Button allows you to choose the Paint Modes, which work in conjunction with the three buttons in the top row, Paint, Line Draw, Curve Draw, and Shape Draw. The paint Modes are: Normal Paint, Blur Paint, Clone Paint, Paste Paint, Pick Paint, Smear Paint, Reveal Paint, Reveal Paint with Color, Reveal Paint with Hue, Reveal Paint with Luminance, Reveal Paint with Tint, Reveal Paint with Hue/Tint, Warp, Sharpen, Emboss, Burn, Dodge, Saturate, De-saturate, and Duplicate.

Some of the Paint Modes can be used in conjunction with each other.

Paint Modes Window & Popup

Figure 4-86. Paint Modes Popup

The Paint Modes popup (***Figure 4-86***) contains buttons to choose the current Paint Mode. These modes are described in the paragraphs below. If Paint is on when you bring the popup up, you can select and try the various paint modes while the popup is up. You can then accept the selected paint mode with the OK button, or cancel your selection with the Cancel button. Note that if Paint is not on when you bring up the popup, it will be turned on after you press OK.

The modes on the right half of the Paint Modes popup (starting with "Reveal") use the current Temp buffer as a source image. For example, the user can use Reveal mode to paint the current temp onto the canvas. The modes on the left half of the popup (starting with "Normal") do not use the current Temp buffer as a source image. They either paint with the current palette color ("Normal"), or apply imaging effects (such as Blur) to the target image.

The paint mode popup also contains a “Temp Position” control, with “Inplace” and “Offset” buttons. These buttons determine how the current Temp buffer image is positioned during modes such as Reveal. These buttons apply to all paint modes in the right half of the Modes popup. They are grayed out when the modes in the left half of the popup are in use.

When the “Inplace” button is on, paint modes such as Reveal utilize the in-place (or original) position of the current temp. This is the default. When the “Offset” button is on, paint modes such as Reveal utilize the temp’s layer position (which is set by activating the Temp as a Layer and positioning it). For example, suppose the user recalls a cutout image to the current temp, then turns the temp on as a layer and moves the layer to the upper right corner of the canvas. When the “Offset” button is on, Reveal paint will reveal from the temp at its layer position (in the upper right corner of the canvas). When the “Inplace” button is on, Reveal paint will reveal the image at its original position.

The Paint Modes are further described in the following paragraphs:

Normal Paint

Normal Paint Mode is the default. You paint with the current brush in the current palette color at the current transparency level.

If no color is selected in the Palette, painting erases the current image on the Canvas.

Smear Paint

In Smear Paint Mode, the existing color on the Canvas is "smeared" or pushed around as you paint. A solid brush drags a piece of the Canvas; an airbrush smears; randomized custom brushes can simulate smoke or dithering. Good for removing or smoothing details in captured frames of video, or for giving painterly effects to captured video. Normally, you would use Smear Paint with a fairly low transparency level, a low Brush Gap, and Exact Mode.

Warp Paint

In Warp Paint Mode, the image on the Canvas is "warped" in the direction that you paint. With a solid brush, the image is offset and slightly blurred. An airbrush offsets and greatly blurs the image.

Blur Paint

In Blur Paint Mode, the image on the Canvas is blurred wherever you paint.

Sharpen Paint

In Sharpen Paint Mode, the image has a sharpen filter applied to it wherever you paint.

Emboss Paint

In Emboss Paint Mode, the image is embossed in the direction you paint. For best results, use a low opacity setting and a light touch on the stylus.

Burn Paint

In Burn Paint Mode, the image on the Canvas is darkened as you paint over it.

Dodge Paint

In Dodge Paint Mode, the image on the Canvas is lightened as you paint over it.

Saturate Paint

In Saturate Paint Mode, the image on the Canvas becomes more saturated as you paint over it.

De-saturate Paint

In De-saturate Paint Mode, the image on the Canvas becomes less saturated as you paint over it.

Clone Paint

Clone Paint picks up one part of the screen and paints it over another part.

To use Clone Paint Mode:

- **Press the Clone Paint Button in the Paint Mode Popup to turn it on.**
- **Position the cursor where you want to paint from and press down.**
- **Holding the pen down, drag to where you want to paint to.** A white line stretches out from the place where you pressed down, which is marked by a white crosshair.
- **Release the pen.** The offset is set to be the distance and angle from the point of first press-down to the point of release. The white line is now attached to your cursor.
- **Paint on the Canvas.** Liberty picks up image from the crosshair and paints with it at the cursor. If you want to reset the offset, use either the

button on the barrel of the pen (available on all but the older model Wacom tablets), or the middle mouse button.

Duplicate Paint

Duplicate Paint Mode works exactly like Clone Paint, except that the offset origin returns to the same place each time you lift the pen/mouse. This is useful for repeatedly copying the same object to different places on the Canvas (for example, replicating trees). This tool is sometimes called "non-aligned Clone."

Reveal Paint

Reveal Paint uses the contents of the Temp Buffer as a source instead of the current color. It reveals the contents of the Temp Buffer into the Canvas while you paint. The lower the setting of the Transparency Slider, the more gradually reveal-painting takes place.

Reveal Paint with Color

Paints the color of the contents of the Temp Buffer into the Canvas, while preserving the luminance of the Canvas image. Only paints into image areas of the canvas.

Reveal Paint with Hue

Paints the hue of the contents of the Temp Buffer into the Canvas, while preserving the saturation of the Canvas image. Maintains highlights. Only paints into image areas of the canvas.

Reveal Paint with Luminance

Paints the luminance of the contents of the Temp Buffer into the Canvas, while preserving the color of the Canvas image. Only paints into image areas of the canvas.

Reveal Paint with Tint

In Reveal Paint with Tint Mode, the contents of the Temp Buffer is reveal-painted into the Canvas while tinting it with the current color. Is not constrained to painting into image areas of the Canvas.

Reveal Paint with Hue/Tint

Reveal Paint with Hue has the same effect as Reveal Paint with Tint, but preserves white high-lights which Tint would have filled with color. Is not constrained to painting into image areas of the Canvas.

Pick Paint

When Pick-Paint Mode is on, Liberty "picks" the color in the Temp Buffer at the current brush coordinates and then paints with that color on the Canvas in the same place. It is similar to Reveal Paint, but it creates a blurred or "painterly" effect. You can get a very large range of effects with Pick Paint using Programmed and User Brushes. By making a Pick Paint Macro you can automate the process and perform it automatically on a number of pictures or frames of captured video (see Macros, page 4-413).

Paste Paint

Paste Paint uses the contents of the Temp Buffer as a brush. Paste Paint allows you to use a brush element that is not limited in size or color like a normal paint brush. It does not use the palette color, but the colors from the image in the Temp Buffer.

NOTE

The Paint Gap Popup (see page 4-257) uses the size of the current brush to calculate where to put down brush images, not the size of the element in the Temp Buffer. It is recommended, if you are not using NoFill Mode, to make the current brush about the same size as whatever element you are Paste-Painting with. Experiment with different brush sizes and Paint Gap Modes.

Clone Temp Paint

Clone Temp Mode works just like Clone Paint except that it uses the image in the current Temp (rather than the Canvas) as a source for painting.

Duplicate Temp Paint

Duplicate Temp Mode works just like Duplicate Paint except that it uses the image in the current Temp (rather than the Canvas) as a source for painting.

4.13.5 Paint On Button

The Paint On Button allows you to choose between Paint On Canvas Mode (which is the default for painting color onto the Canvas) or Paint On Mask Mode, which uses the current brush and transparency to paint on the mask layer. All of the other mask functions are located on the Mask Panel, the rightmost of the four Panel Menu positions by default. For more detail about masks and masking, see page 4-363, the Mask Panels.

Fractal Paint Button

Fractal painting moves the brush along a jagged path (for painting rough, natural-looking strokes). Fractal painting can also branch out into multiple paths, which is useful for effects such as lightning. The main Fractal Button turns Fractal Mode on and off. You can use Fractal mode with any of the painting tools (Paint, Line, Curve, and Shape), and any of the other painting effects (for example, Jitter).

Fractal Popup

Figure 4-87. The Fractal Popup

The Fractal corner button brings up the Fractal Popup with a Roughness Slider and a Radiate On/off Button. The slider controls the jaggedness (randomness) of the fractal strokes, while Radiate Mode, when on, causes multiple strokes to branch out as you paint. The red Reset Button resets the slider to default and the Radiate Button to off. The OK Button confirms the settings and brings down the popup, while the Cancel Button brings down the popup while reverting to the previous settings.

Try using Radiate Mode with Smear Paint on a Canvas image for some nice water color and broken glass effects. Also, try using Fractal Paint in a Macro. Since the random numbers used by Fractal Paint change each time the Macro is run, the fractal lines will appear to dance from frame to frame as the Macro renders.

Cancel Button

The Cancel Button reverts to the prior randomness value, but doesn't reset the Radiate Button setting.

4.13.6 Fold Button

NOTE

The Fold, Noise, Jitter, and Pressure buttons can be active simultaneously, or in any combination, along with the current Paint Mode.

When Fold Paint Mode is on, painting "wraps around" - that is, when you paint off one edge of the Canvas, it spills over on the opposite edge. Painting off the right edge spills over onto the left edge and vice-versa. Top/bottom painting works the same. This results in a Canvas whose edges can be joined together seamlessly when, for instance, it is texture-mapped in a 3D program.

To paint a seamless rectangle for tiling:

- **Use Rectangle Mask (see page 4-368) to mask a rectangle on the Canvas.**
- **Press Fold Paint to turn it on.**
- **Paint into the rectangle, painting across edges.**

- **Cut the painted rectangle into the Temp Buffer and use Copy/Tile to tile it without gaps.** See page 4-143 for details about Copy/Tile.

4.13.7 Noise Button

When noise is enabled, colors on the brush are randomized as they are painted, introducing textures and grains to the painted strokes. This feature can be used to achieve more natural-looking paint effects, or to re-introduce grain into a touched-up area of film/video.

Noise can be used with all Canvas paint modes (normal, reveal, clone, etc.) except for Paste. Noise can also be used with erase paint and painting to mask.

To use Noise Paint Mode:

[ ] 1. **Set the Transparency Slider Scale near the bottom.** This allows the grain or noise to build up slowly.

[ ] 2. **Press the corner button of the Noise Paint Button.** The Noise Paint Popup appears.

[ ] 3. **Use the sliders to choose the amount of noise for Hue, Saturation and Value, and for each color component.** Gauss mode with the Red, Green, and Blue sliders at the top is usually appropriate for most uses, but you will want to experiment with each individually to choose your favorite.

[ ] 4. **Press OK.**

[ ] 5. **Paint on the Canvas.** As you paint, graininess, or noise, is introduced as the brush is moved along.

Noise Popup

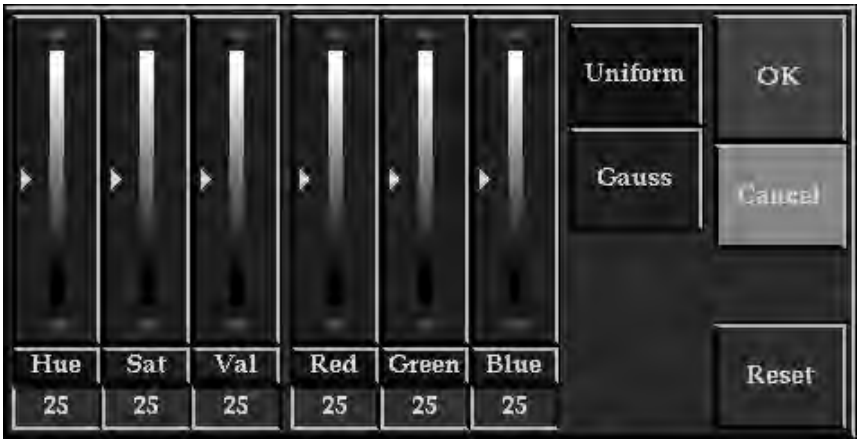

Figure 4-88. Noise Popup

The Noise Popup contains sliders scales to control how much noise is painted into the six channels: Hue, Saturation, Value, Red, Green, and Blue. It also has two noise modes, Uniform and Gauss, which give slightly different effects. You can simultaneously paint and adjust the sliders while the popup is up, to test out different combinations of effects.

NOTE

The red slider is also used for Mask Paint and Erase Paint.

4.13.8 Jitter Button

Jitter Paint adds a random positional jitter to painting. The paint brush bounces around randomly to give a scatter-paint effect. You can control the amount of jitter with a slider on the Jitter Popup.

Jitter Popup

Figure 4-89. Jitter Popup

To vary the amount of jitter in Jitter Paint:

- **Press the corner button of Jitter Paint.** The Jitter Popup appears.
- **Press and drag the Jitter Slider.** The scale goes from 0 to 300.
- **Press OK to set the value and remove the popup.**

Jitter Paint can be used with all other Paint Modes including Paint On Mask, as well as with Line, Curve, and Shape Draw.

4.13.9 Pressure Button

Pressure Paint is a mode which, when enabled, invokes the pressure-sensitive features of the tablet. With the Pressure Popup, pen pressure can control brush size, jitter, rotation, and color, as well as transparency. If you are using a mouse, or if the current

tablet is not pressure-sensitive, the Pressure Button does nothing. Pressure Mode works with all Paint Modes (including Paint On Mask.)

Press the Pressure Button to turn on/off pressure-sensitive mode.

Pressure Popup

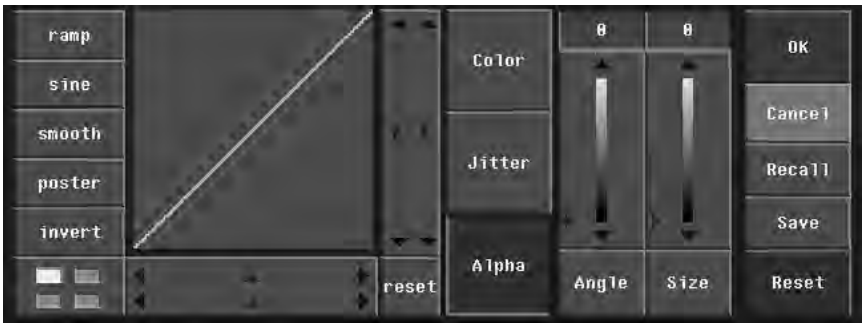

Figure 4-90. Pressure Popup

Press the corner button of the Pressure Button to call up the Pressure Popup. Use the Pressure Popup to assign different painting functions to pressure-sensitivity. They include Angle, Size, Alpha (transparency), Jitter, and Color. You can use any combination of these modes at one time.

NOTE

Angle only works with user brushes, since the other brush types (Air, Solid, and Programmed) are rou7nd.

To access the Pressure Popup:

- **Press the corner button of the Pressure Button.** The Pressure Popup appears.
- **Press the modes you want to turn on or off.** You can use any combination of the modes: angle, size, alpha, jitter, and color.
- **Press the OK Button.** The Pressure Popup disappears. The Pressure Button stays on.
- **Proceed to paint on the Canvas.**

Pressure Angle Button

With the Pressure Angle mode on, the brush rotates clockwise in Z the harder you press. Zero pressure equals zero rotation (12 o'clock). Pressure Angle mode only works with User-Defined brushes, because all other brushes are round and do not vary when rotated in Z.

Angle Slider

Press and drag the Angle Slider Scale to set the maximum rotation when Pressure Angle mode is on. If the Angle Slider is set at 180, then pressing down half-way will turn the brush 90 degrees, and using full pressure will turn it 180 degrees.

Pressure Size Button

When Pressure Size mode is on, brush size varies dynamically with pressure. The harder you press, the bigger the brush gets. With minimum pressure, the brush size is the value defined in the Brush Size Slider. With maximum pressure, the brush size equals the size defined in the Brush Size Slider plus the setting of the Size Increase Slider.

Size Increase Slider

Press and drag the Size Increase Slider to set the difference between the brush sizes at minimum and maximum pressure. If the Brush Size Slider is at 10% and the Size Increase Slider is at 40, then the brush size at minimum pressure is 10 and at maximum pressure, 50.

Pressure Alpha Button

When Pressure Alpha mode is on, brush opacity varies with pressure. The harder you press, the more opaque the brush is. With minimum pressure, the brush is transparent. With maximum pressure, the brush opacity is defined by the current setting of the Transparency Slider.

Pressure Jitter Button

When Pressure Jitter mode is on, the amount of jitter of brush placement varies with pressure. At minimum pressure, there is no jitter. At maximum pressure, jitter is defined by the current setting of the Jitter Slider in the Jitter Popup. Pressure Jitter only works if you turn on the Jitter Button and it is set to a value greater than 0 (see the Jitter Button, below).

Pressure Color Button

When Pressure Color mode is on, brush color varies with pressure. At minimum pressure, the brush uses the first color selected in the palette (when Multicolor Mode is activated.) At maximum pressure, the brush uses the last color selected in the palette. At pressures between minimum and maximum, the brush uses the selected colors between the first and the last selected colors, with smooth interpolation between colors. This works in normal paint mode, and also with Reveal-Tint and Reveal-Tint-Hue modes.

To paint, varying brush color with pressure:

[ ] 1. **Turn on Multi-color Mode in the palette.**

[ ] 2. **Choose a range of colors by underlining them.**

[ ] 3. **Press the corner button of the Pressure Paint Button.** The Pressure Popup appears.

[ ] 4. **Press the Pressure Color Button to turn it on.**

[ ] 5. **Press the OK Button.**

[ ] 6. **Paint with varying pressure.**

Pressure OK Button

Press to confirm the settings in the Pressure Popup and remove the popup. If all the Pressure Mode Buttons are off, the Pressure Paint Button will be off when the popup disappears. If any of the Pressure Mode Buttons are on, the Pressure Paint Button will be on when the popup disappears.

Pressure Diagram

Allows you to re-map pressure values coming from the tablet, thereby modifying how pressures affect painting.

For instance, you could invert the Diagram Curve, causing pressure values to be inverted. Pressing harder would have the opposite of the usual effect. In Size Mode, pressing harder would result in a smaller brush size.

Pressure Cancel Button

Press to cancel changes you've made in the popup and remove the popup.

Pressure Save Button

Press to save the current Pressure Diagram.

Pressure Recall Button

Press to recall a Pressure Diagram from the disk.

4.14 IMAGE TOOLS PANELS

The Image Tools Panels contain functions which operate on the masked area of the Canvas, altering it in some way. Many of the tools have popup menus which allow you to change settings and preview them.

If no mask is active on the Canvas, the functions operates on the entire Canvas.

Most Image Tools buttons have a popup, invoked by pressing on the corresponding corner button. The popup allows settings for the tool to be adjusted. Once the settings have been chosen, pressing on the tool's main button performs the function, using the last settings chosen in the pop-up.

Preview Buttons

Most Image Tools popup menus have two preview buttons: Preview and Active. Press the Preview Button to preview the results of the current settings. Press the Active Button to turn on Active Mode, which will preview the results of the settings every time you make a change in them. Active Mode works well when you have a small area masked in which to preview the changes (or a very fast computer).

Image Tools Popup OK and Cancel Buttons

Most Image Tools popup menus have an OK and a Cancel button. Pressing the OK Button performs the function and removes the popup. Cancel removes the popup with no change to the Canvas.

Applying Image Tools to Temps and Masks

The Image Tools Panels have a Canvas/Temp Mode bar on the top, similar to the Paint Panel. In Canvas Mode, the Image Tools apply to the Canvas. In Temp Mode, they apply to the current Temp (the Temp must be an active layer). Thus, you can apply Image Tools and their previews to various individual layers on the Canvas by selecting a layer as the current layer, then applying the function as desired. Note that several Image Tools are not implemented for Temp Mode. This is generally because such tools require both the current Temp and the Canvas. The following Image Tools are not implemented in Temp Mode: Reveal, both Morph functions, Motion Tracking, and Dither. These buttons are grayed out when Temp Mode is active.

In Mask Mode, Image Tools are applied to the current mask.

4.15 Image Tools 1 Panel

Figure 4-91. Image Tools 1 Panel

4.15.1 Image Tools 1 Adjust Button

Press the Adjust Button to adjust contrast, brightness, and gamma in the masked area of the Canvas, according to the settings of the Adjust Popup. Press the corner button of Adjust to call up the Adjust Popup.

Adjust Popup

This popup allows you to adjust brightness, contrast, and gamma all at once, using one Diagram Curve. You can adjust these values in two ways: (1) With the Diagram and (2) With the Sliders. Altering the Sliders also alters the Diagram.

Sliders

There are three sliders, each with a mode button beneath. If the mode button is on, then the slider's setting is reflected on the Diagram Curve. If the mode button is off, the slider has no effect.

Contrast Slider

Press and drag the Contrast Slider to increase and decrease contrast. The Contrast Slider ranges from -63 at the bottom to +63 at the top.

Brightness Slider

Press and drag the Brightness Slider to increase and decrease brightness. The Brightness Slider ranges from -100 at the bottom to +200 at the top.

Gamma Slider

The Gamma Slider ranges from +50% to -50%. A positive percentage darkens the dark values; a negative percentage brightens the light values.

Experiment with the Adjust Popup to understand what its effects are.

High Contrast Mode

High Contrast Mode has the same effect as Contrast Mode with the slider at the top.

Normalize Mode

Adjusts the contrast of the image so that the full range of brightness values are utilized. (When this mode is selected, a momentary pause may occur while the software scans the image to determine its brightness range.) Normalize mode stretches the lightest and darkest values in the selected area to true white and true black; a low-contrast picture will look as if a gray film has been lifted from it when it is Normalized.

NOTE

Contrast, High Contrast, and Normalize are mutually exclusive.

Adjust Diagram

The Diagram used with Adjust changes the distribution of contrast, brightness, and gamma correction. A straight diagonal ramp gives a one-to-one for no adjustment. If you alter the curve, the masked areas of the Canvas are adjusted according to the curve. You can drag the sliders to see how they affect the curve; then you can further adjust the curve in three ways: (1) Drag the Diagram Sliders (the arrow buttons adjacent to the Diagram), or (2) Press and drag directly on the curve to modify it graphically, or (3) Use the Curve Functions to smooth the curve, posterize the curve, or invert the curve. You can use any or all of these methods at the same time. When you have created a useful curve you can save it on disk for later recall back into the Diagram. Press the Red Reset Button to restore the diagonal straight default Diagram. Press the small gray Reset Button to reset only the sliders. The best way to learn to use the Diagram Curve with Adjust is to experiment.

Preview and the Active Preview Button

Press Preview to see a preview of the adjustment. When the Active Button is on, every change you make on the Diagram or Sliders will update the preview.

OK Button and the Cancel Button

Press OK to perform the adjustment; press the Cancel Button to remove the popup with no adjustment.

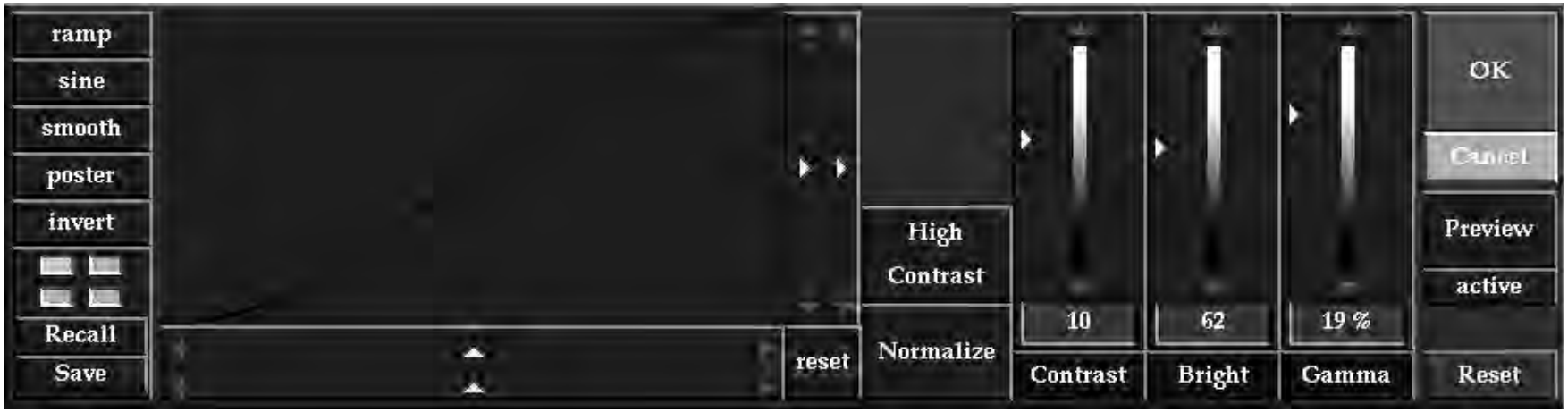

Figure 4-92. Adjust Popup

4.15.2 Color Correct Button

The Color Correct Button gives you a popup that allows you to correct the Hue, Saturation, Value, or Alpha (HSVA) of the masked area of the Canvas. You can also correct in the color spaces of RGBA, CMYK, or RGBB. If nothing is masked, the entire Canvas is affected.

Press the corner button of the Color Correct Button to call up the Color Correct Popup.

Color Correct Popup

The Color Correct Popup (Figure 4-93) contains a set of four sliders and diagrams, one for each component. You manipulate these sliders and diagrams to alter the way the component is applied to the masked area of the Canvas.

Changing the sliders performs a global adjustment on the given color component, while the diagrams allow more localized adjustments to be made (note that adjusting the diagrams always overrides the corresponding slider adjustments.) The sliders come up straight above the leftmost diagram. Each slider is labeled with the corresponding color component (e.g. H, S, V, A). The diagrams, although not labeled, appear in this same order, left to right.

Color Correct Diagrams

The Diagrams used with Color Correct change the distribution of the components in the masked area of the Canvas. A straight diagonal ramp gives a one-to-one correlation for no correction. If you alter the Diagram Curves, the masked areas of the Canvas are corrected accordingly. You can adjust the Diagram in three ways: (1) Drag the Diagram Sliders (the

arrow buttons adjacent to the Diagram), or (2) Press and drag directly on the curve to modify it graphically, or (3) Use the Curve Functions to smooth the curve, posterize the curve, or invert the curve. You can use any or all of these methods at the same time. When you have created a useful set of curves you can save it on disk for later recall back into the Diagrams. Press the Red Reset Button to restore all the Diagrams to the diagonal straight default ramp. Press the small gray Reset Buttons to reset only each set of sliders. The best way to learn to use the Diagram Curves with Color Correct is to experiment.

Simple Adding or Subtracting of a Component

By dragging the left vertical slider down, you reduce the amount of any given component. By dragging it up you increase the amount of that component.

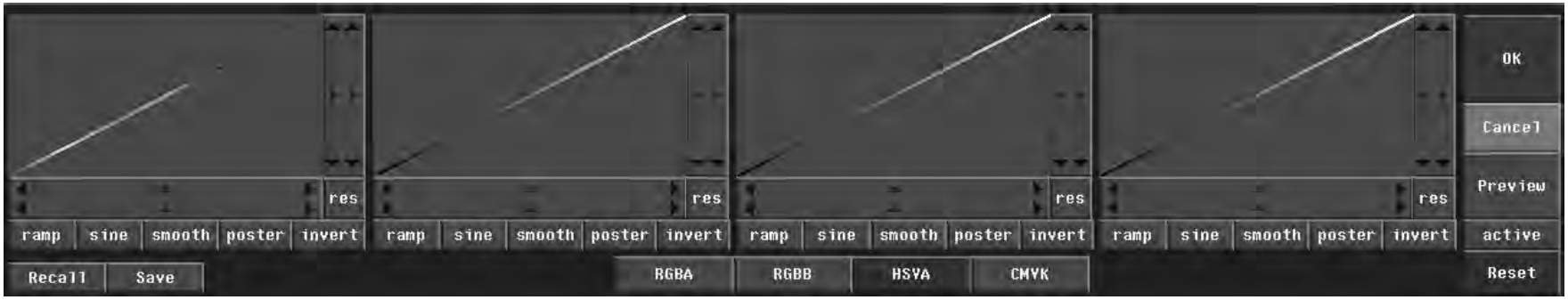

Figure 4-93. Color Correct Popup

HSVA

Assigns Hue, Saturation, Value, and Alpha components to the four Diagrams.

RGBA

Assigns Red, Green, Blue, and Alpha components to the four Diagrams.

RGBB

Assigns Red, Green, Blue and Brightness controls to the four Diagrams. This allows the user to adjust the individual image components (Red, Green, and Blue), at the same time as adjusting the overall image brightness (with the rightmost diagram, or the rightmost slider labeled "Br").

CMYK

Assigns Cyan, Magenta, Yellow, and Black components to the four Diagrams.

Preview , Active Preview Button s

Press Preview to see a preview of the adjustment. When the Active Button is on, every change you make on the Diagram or Sliders will update the preview.

OK , Cancel Buttons

Press OK to perform the adjustment; press the Cancel Button to remove the popup with no adjustment.

4.15.3 Noise Button

The Noise Button allows you to apply grain and noise effects to the masked area of the Canvas. It can also be used to generate a variety of interesting tex-

ture patterns. Noise effects can also be animated using the Mask Actor in the Animation Environment.

To apply noise into an area:

- **Mask the desired area on the Canvas.** If there is no mask active on the Canvas, the entire Canvas will have noise applied.

- **Press the corner button of the Noise Button to call up the Noise Popup.** The Noise Popup appears. If you press the main part of the Noise Button, noise is applied according to the current settings.

- **Press some of the Color Controls to high-light them.** This designates the channels on the Canvas where the noise will appear.

- **Choose one of the Noise Modes** (Uniform, Gauss, etc.).

- **Press OK.** The noise is applied into the masked area.

Noise Popup

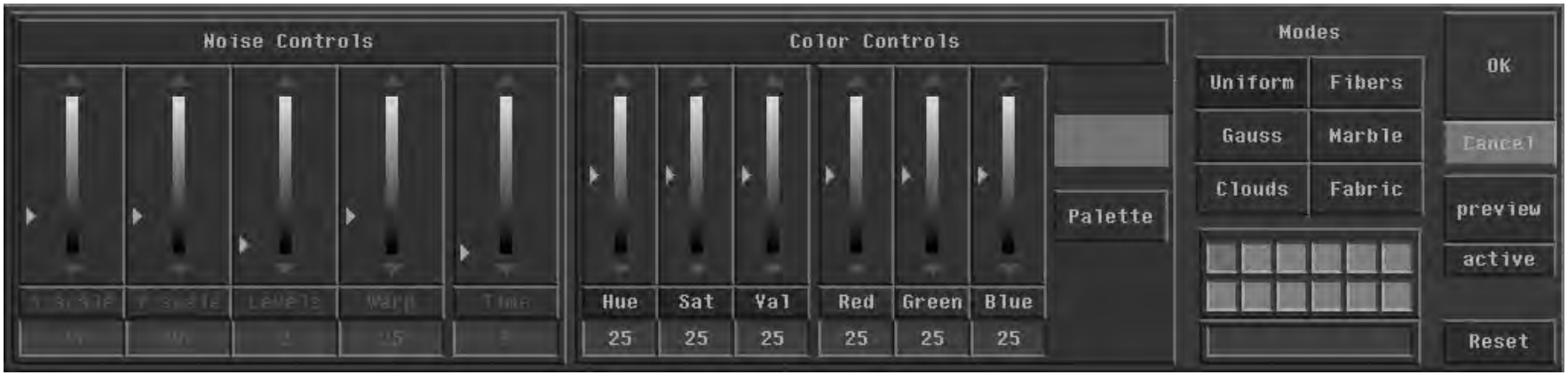

Figure 4-94. Noise Popup

The Noise Popup contains a host of tools for controlling the application of different kinds of noise to the Canvas.

Palette Button

When the Palette Button is high-lighted, noise is applied using the Palette colors that are currently selected in the Palette (instead of the image on the Canvas). There must be at least two colors selected (in the Palette's Multiple Colors Mode). Pressing on the Color Chip Button above the Palette Button displays the currently selected Palette colors that will be used to generate the noise.

To turn the Palette Button off, just press on one of the Color Control Buttons (Hue, Saturation, Brightness, etc.) and noise will be applied to that channel of the image on the Canvas (instead of to the Palette colors).

Noise Modes

Press on one of the Noise Modes to highlight it. You can control how the Uniform and Gaussian Modes are applied to the Canvas by adjusting the HSV and RGB sliders at the left.

You can further control the Clouds, Fibers, Marble, and Fabric Modes by also adjusting the X Scale, Y Scale, Levels, and Time sliders on the left. Marble and Fabric Modes can be given additional control by adjusting the Warp Slider.

X Scale Slider

Provides control of the width of the noise for Clouds, Fibers, Marble, and Fabric Modes.

Y Scale Slider

Provides control of the height of the noise for Clouds, Fibers, Marble, and Fabric Modes.

Levels Slider

Provides control of the amount of "granularity" of the noise for Clouds, Fibers, Marble and Fabric Modes. The higher the setting the more grainy the noise.

Warp Slider

Provides control of the warp distortion of the noise for Marble and Fabric Modes. Marble Mode is directional, controlled by the setting of the Direction "Clock" near the Brush Display at the top left of the Paint Environment. To see how Warp interacts with Marble Mode, try Marble Mode with the Warp setting at one (1), then again with Warp set at a higher number.

Time Slider

Primarily used for controlling noise applied over time in the Mask Actor in the Animation Environment. Changing the setting of the Time Slider alters the distribution of the noise. Making small, incremental changes in the Time settings makes small, incremental variations in the distribution of the noise.

Elevator Presets

The popup has twelve presets for saving different configurations of the settings for Noise.

The Preview and the Active Preview Button

Press Preview to see a preview of the noise. When the Active Button is on, every change you make on the popup updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the noise on the masked area.

4.15.4 Apply Button

The Apply Button applies a color, or colors, to the masked area. When a single palette color is chosen, that color is applied uniformly to the masked area. If multiple palette colors are chosen, a gradated wash is applied from the palette.

Apply Popup

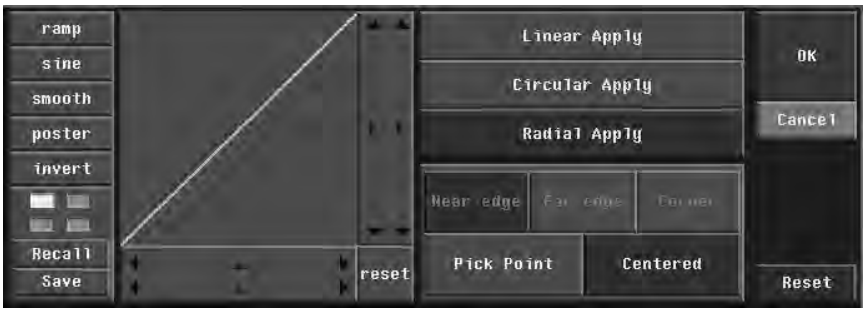

Figure 4-95. Apply Popup

Press the corner button of Apply to call up the Apply Popup. The Apply Popup has three basic options: Apply, which gives a straight-line gradation of color to the masked area; Circular Apply, which gives a concentric gradation of color to the masked area; and Radial Apply, which gives a radial (sweeping) gradation of color to the masked area.

The OK button in the apply popup applies a gradation to the canvas, based on the settings in the popup. It also brings down the popup. The Cancel button brings down the popup (without applying a gradation).

Once the user has adjusted settings in the Apply Popup, the main "Apply Color" button in the (Image Tools 1 Panel) applies a gradation to the canvas (based on the settings in the popup, but without bringing up the popup).

Linear Apply Button (on the Apply Popup)

When the Linear Apply Button is highlighted, you are in Linear Apply Mode. In this mode (which is the default) multiple colors chosen on the palette are applied to the masked area in a linear gradation. The direction of the gradation depends on the Direction Button, see page 4-59. The gradation always starts with the upper, left-most color selected in the palette and proceeds to the lower, right-most color selected in the palette.

Circular Apply Button

When the Circular Apply Button is highlighted, you are in Circular Apply Mode. In this mode multiple colors chosen on the palette are applied to the masked area in a circular gradation. The upper left-most color in the palette starts at the center and moves outward, ending with the lower right-most color in the palette. Circular Apply has several modes that control how color is distributed, described below.

Radial Apply Button

When the Radial Apply Button is highlighted, you are in Radial Apply Mode. In this mode multiple colors chosen on the palette are applied to the masked area in a radial gradation. The colors are gradated as if they were swept by a rotating arm. The starting angle of the gradation is set using the Direction Button (page 4-59). Only the Centered and Pick Points modes below affect Radial Apply.

Near Edge Mode

When Near Edge Mode is enabled, the Circular Gradation starts at the center of the bounding box of the masked area and ends at the nearest edge of the bounding box of the masked area. Does not apply to Radial Gradation.

Far Edge Mode

When Far Edge Mode is enabled, the Circular Gradation starts at the center of the bounding box of the masked area and ends at the farthest edge of the bounding box. This makes for a more diffuse gradation than Near Edge, since it is over a longer distance. Does not apply to Radial Gradation.

Corner Mode

When Corner Mode is enabled, the Circular Gradation starts at the center of the bounding box of the masked area and ends at the farthest corner of the bounding box. This makes for the most diffuse gradation of all, since the farthest corner is a greater distance than the farthest edge. Does not apply to Radial Gradation.

Pick Point Mode

Pick Point allows you to choose where the Circular or Radial Gradation starts within the bounding box of the masked area. To select a new origin for either the Circular or Radial Gradation, click on the Pick Point Button (at which time all the menu buttons will be grayed out), then click on the Canvas to set the new origin.

Centered Mode

Centered Mode is the default; it starts the Circular or Radial Gradation at the center of the bounding box of the masked area.

Apply Diagram

The Diagram used with Apply changes the distribution of colors in a multiple-color apply. The vertical axis represents the colors of the apply, while the horizontal axis represents the space the apply fills. A straight diagonal ramp gives a one-to-one correlation between colors and space, for a normal, linear, default apply. If you alter the curve, the colors are given a different distribution. You can alter the curve in three ways: (1) Drag the sliders, or (2) Press and drag directly on the curve to modify it graphically, or (3) Use the Curve Functions to smooth the curve, posterize the curve, or invert the curve. You can use any or all of these methods at the same time. When you have created a useful curve you can save it on disk for later recall back into the Diagram. Press the Red Reset Button to restore the diagonal straight default Diagram. Press the small gray Reset Button to reset only the sliders. The best way to learn to use the Diagram Curve with Apply is to experiment.

4.15.5 Color Clip Button

Figure 4-96. Color Clip Popup

Press the Color Clip Button to clip the colors in the masked area of the Canvas to legal NTSC or PAL colors. Press the corner button of Color Clip to call up the Color Clip Popup.

NTSC Mode

Press to enable NTSC Mode, which causes Color Clip to clip colors to NTSC legal values.

PAL Mode

Press to enable PAL Mode, which causes Color Clip to clip colors to PAL legal values.

Gamma Correct Window

Press in the window to type in a gamma correction value, which is utilized in conversion to/from NTSC/PAL Color Space. A value of "1" means that no gamma is applied in this conversion.

NOTE

Ths Color Clip button is inactive in Liberty 64, since it does not pertain to film or the 64-bit color space.

4.15.6 Posterize Button

Figure 4-97. Posterize Popup

Press to posterize the selected area. The corner button calls up a popup with a slider with 30 levels for posterization.

The lower the slider values; the heavier the posterization effect (as the slider represents the number of colors the canvas is being reduced to).

Preview and the Active Preview Button

Press Preview to see a preview of the posterization. When the Active Button is on, every change you make on the slider updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the posterization on the masked area.

4.15.7 Map Button

Press to map selected palette colors onto the Canvas using the active mask.

Map takes the chosen (underlined) colors in the palette and uses the active mask to map them to the Canvas. For example, with red as the first and blue as the second color chosen in the palette, unmasked pixels become pure red, completely masked pixels become pure blue, and any in-between mask values become some shade of purple. Of course, you can use as many colors as you like, and they are interpolated across the whole range of mask values.

The Map Window

Figure 4-98. Map Modes Popup

The Map Window displays the current Map Mode. Pressing on the mode label calls up a popup with 7 mode buttons. Press on one to activate it. If Color Mode is on, the colors map onto the RGB of each pixel as described above. The Red, Green, and Blue

Buttons map only onto R, G, and B respectively. The Hue, Saturation and Value Buttons map onto H, S, and V.

Map Popup

Figure 4-99. Map Popup

Press the corner button of the Map Button to call up the Map Popup. The Map Popup has buttons for the same modes as the Map Modes Popup, but also has the Obey Mask Button and preview tools.

Obey Mask

When Obey Mask is on, Map does nothing for pixels where the mask is zero.

For example, if you do a gradated rectangle mask in the middle of the Canvas, and choose red and green in the Palette, Map will make the gradated mask a color gradation from red to green. If Obey Mask is off, areas where the mask is zero (the area outside the rectangle, for example) will become red. If Obey Mask is on, nothing happens to these areas, since zero values are not mapped.

Preview and the Active Preview Button

Press Preview to see a preview of the map. When the Active Button is on, every change you make on the popup updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the map on the masked area.

4.15.8 Reveal Button

Figure 4-100. Reveal Modes Popup

The Reveal Button allows you to bring color or luminance information from the current Temp Buffer onto the Canvas in preset ways. Includes Reveal Color, Reveal Luminance, and Reveal Hue. Press the Reveal Button to apply the Temp Buffer to the Canvas using whatever mode is displayed in the text window. Press on the word in the window to call up the modes popup.

Reveal Color

Reveal Color reveals the color of the image in the current Temp Buffer into the masked area of the Canvas with the luminance of the Canvas image preserved. It is an interesting and dynamic way to combine pictures. One use is to apply a texture (e.g., wood, marble) from the Temp Buffer to the image in the Canvas, while preserving the shadows and highlights in the Canvas, making it look as if it were made of wood or marble.

Reveal Luminance

Reveal Luminance reveals the luminance of the image in the Temp Buffer into the masked area of the Canvas, with the hue and saturation of the Canvas preserved.

Reveal Luminance is the reverse of Reveal Color in this way: Reveal Color reveals the color (hue and saturation) from the image in the Temp Buffer into the Canvas, with only the luminance of the Canvas preserved; Reveal Luminance reveals only the luminance from the image in the Temp Buffer into the Canvas, with the color (hue and saturation) of the Canvas preserved; thus, revealing luminance from element A into element B is identical to revealing color from element B into element A.)

Reveal Hue

Reveal Hue reveals only hue, leaving saturation unchanged. Use to put a color texture on an object with white highlights, because white remains white. Reveal Hue really does the same thing as Tint-Hue, but can reveal the hues from an entire picture instead of just tinting with one color.

4.15.9 Tint Button

Press to tint the masked area on the Canvas using the slider settings in the corresponding popup. There are two modes on the popup; Hue, which changes hue only, and Hue & Sat, which changes both Hue and Saturation.

Tint Popup

Figure 4-101. Tint Popup

Press the corner button of Tint to call up the Tint Popup.

Hue Mode

Press to tint the masked area on the Canvas with the hue slider value, ignoring saturation.

If no mask is active on the Canvas, the entire Canvas is tinted.

Saturation Mode

Press to tint the masked area on the Canvas using the hue and saturation slider values. The current color must not be white, black or gray.

If no mask is active on the Canvas, the entire Canvas is tinted.

4.15.10 MultiTint Button

This function allows you to tint using two or more colors on the palette. It's a combination of Tint and Apply, allowing you to create tinted gradations. Only linear gradations are supported, not radial gradations. Press to tint the masked area on the Canvas using the current palette colors. There are two modes in the text window: Hue, which tints only into Canvas areas with some chroma, ignoring areas with no color but only gray-scale, and H&S, which tints into both hue and saturation, so that gray-scale areas are tinted as well as areas with chroma.

As with Apply, the Direction button (See ***"Direction Button" on page 4-58***) determines the direction of the gradation.

To Multitint an area:

- **Mask an area on the Canvas.**
- **Choose two or more colors on the palette by underlining them.**
- **Press in the text window of Multitint to choose Hue or H&S Mode.**
- **Press the main part of the Multitint Button.** The masked area is tinted with a gradation.

4.15.11 Sharpen Button

Applies a sharpening filter to the masked area. Press the corner button to display the Sharpen Popup.

Sharpen Popup

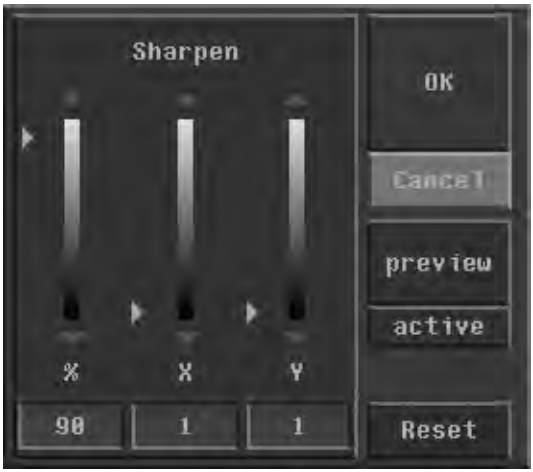

Figure 4-102. Sharpen Popup

The Sharpen Popup has three slider scales that control how the sharpen filter is applied to the Canvas. The % slider controls the amount of sharpen. The X slider controls the horizontal range of the sharpen (0 to 30). The Y slider controls the vertical range of the sharpen (0 to 30).

Preview and the Active Preview Button

Press Preview to see a preview of the sharpen. When the Active Button is on, every change you make on the Sliders updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the sharpen on the masked area.

NOTE

Sharpen previews skip the areas around the edge of the canvas (to preview faster). The higher the sharpen X and Y sliders, the more pixels around the edge are skipped.

These pixels will be processed, however, during the actual sharpen operation (started with "OK" or the main sharpen button).

4.15.12 Blur Button

The Blur Tool blurs the masked area of the canvas (or the entire canvas if no mask is active). There are six different Blur modes to choose from, including Fast, Gaussian, Min, Max, Median, and Despeckle. In addition, the amount of blur in the X and Y directions can be controlled using slider settings.

The main Blur button contains an inset window (to view and set the Blur mode) and a corner button to bring up a Blur popup (which allows the user to set the sliders, choose the blur mode, preview the effect, and apply the effect to the canvas). Pressing the main blur button applies the blur effect to the canvas with the current settings.

Blur Mode Inset Button

Press in the inset window in the Blur Button to toggle between the six blur modes (Fast, Gaussian, Min, Max, Median, and Despeckle.)

Fast Blur: This mode applies a heavy, uniform blur to the canvas. The effect is fast to process, but can introduce some slight artifacts (especially on corners of objects).

Gaussian Blur: This mode applies a softer, weighted blur to the canvas. This effect is slower to process than Fast Blur, but produces a cleaner effect.

Min Filter: The Min Filter works by taking the minimum value of each pixel and its neighbors (within the area whose size is defined by the X and Y sliders). This tends to make dark areas of the image spread out, and tends to give the image a hand-painted, impressionist, or cubist look. Its effects are especially pleasing when applied to background images. Using large X and small Y values (or visa versa) tends to provide the appearance of a wood carving.

Max Filter: The Max Filter works by taking the maximum value of each pixel and its neighbors (within the area whose size is defined by the X and Y sliders). This tends to make bright areas of the image spread out, and tends to give the image a hand-painted, impressionist, or cubist look. Its effects are especially pleasing when applied to background images. Using large X and small Y values (or visa versa) tends to provide the appearance of a wood carving.

Median Filter: The Median filter is commonly used to remove noise from images. It is especially good at removing random spots or specks of noise in an image (for example, freckles on a person's skin). Of course, the higher the value of the X and Y sliders, the more noise is removed. The Median filter can also be utilized as a special effect, as it tends to give images a very smooth, watery look.

Despeckle Filter: The Despeckle Filter is similar to the Median filter, in that it removes noise (especially random spots or specks of noise) from images. It has the additional benefit of preserving detail and edges

in the image, however. While the median filter tends to blur out such details, the despeckle filter preserves them, while at the same time removing noise. This filter is noticeably slower than the Median filter, since it does more computation for each pixel.

NOTE

The six Blur modes can also be set within the Blur popup (accessed through the corner button).

Blur Popup

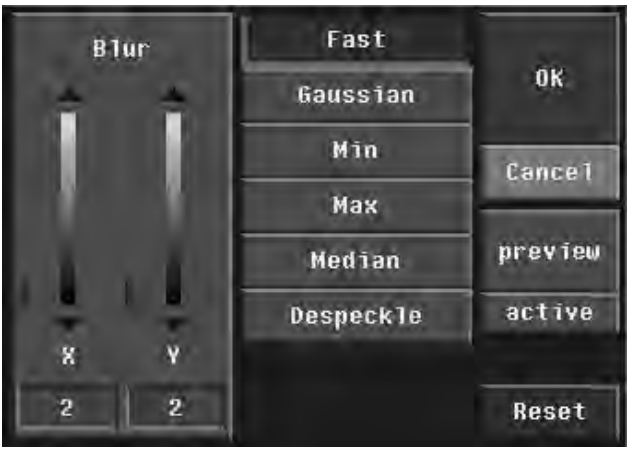

Figure 4-103. Blur Popup

Press the corner button of Blur to call up the Blur Popup.

Blur Sliders

There are two slider scales: one for the amount of horizontal blur, the other for the amount of vertical blur. Moving the x slider causes both the x and y sliders to move together. To set separate x and y values, move the x slider first, then the y slider,

which operates separately from the x slider. The slider settings represent the pixel width of the blur. The sliders range on a scale from 0 to 30.

Blur Mode Buttons

These select between the six blur modes (Fast, Gaussian, Min, Max, Median, and Despeckle.)

Preview and the Active Preview Button

Press Preview to see a preview of the blur. When the Active Button is on, every change you make on the popup updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the blur on the masked area.

NOTE

Blur previews skip the areas around the edge of the canvas (to preview faster). The higher the Blur X and Y sliders, the more pixels around the edge are skipped.

These pixels will be processed, however, during the actual Blur operation (started with "OK" or the main Blur button).

4.15.13 Filter Button

Press the Filter Button to apply the current filter to the masked area of the Canvas, using the settings of the Filter Popup.

Filter Popup

Press the corner of the Filter Button to call up the Filter Popup (page 4-327). In other Image Tools, Liberty uses standard filters to perform operations like blurring, sharpening, edge enhancement, etc. The Filter Popup allows you to customize existing filters and create filters of your own from scratch in an infinite variety. The Filter Popup is extraordinarily powerful, but requires experimentation to explore the possibilities. The main part of the Filter Popup is a 5 x 5 array of boxes, the Filter Array.

Filter Array

The Filter Function changes each pixel in a masked area (or the entire Canvas) based on its neighboring pixels. The Filter Array determines how each neighbor contributes to the result. The Filter Array is a 5 x 5 array of boxes, each representing one pixel. The center pixel is surrounded by two ranks of neighboring pixels. You assign numerical values to each box, thereby controlling how each pixel affects its neighbor. For example, if the center value is 1 and all its neighbors (adjacent pixels) are 0, the filter leaves all pixels unchanged. Setting all values to 1 makes all neighbors contribute equally, blurring the image. Negative values subtract. Values are in the range of minus (-) 9999 to plus (+) 9999.

NOTE

Zero values in this array are displayed as blank boxes on the menu. This helps make the menu easier to read.

Figure 4-104. Filter Popup

To change a value in the Filter array:

- **Press a box in the Filter array.**
- **Type a number, followed by the Enter key.**

Prefix Buttons with the Filter Array

The Prefix Buttons provide a quick way to repeatedly enter the same values into the Filter boxes. You can press the Copy Prefix (page 4-62), then one of the Filter Array Boxes, to put the last entered value into the box. Pressing the Add Prefix, then pressing a Filter Array Box, adds the last entered value to the number in the box. Pressing the Add and the Inverse Prefixes, then a Filter Array Button subtracts the last entered value from the number in the box.

Filter Slider

Press and drag the slider to proportionately adjust all the values in the Filter Array. Often you'll get the best results by incrementing the Filter Slider one unit at a time by pressing the arrow buttons at the top or bottom of the slider. If some values in the Filter Array don't change enough with the slider, you can always enter values numerically by pressing in the Array Box you want to change and typing the number on the keyboard, followed by the keyboard's enter key.

Filter Elevator

The Filter Elevator has 20 levels, the first 7 of which are pre-set and can't be modified. The last 13 are empty for you to put your own filters into. You can copy an existing filter to an empty level using the Copy Prefix Button. You can add an entire filter to another with the Add Prefix Button.

The first 7 Filter Elevator levels are, from the left: Sharpen, Edge Enhance, Edge Detect, Relief, Rattle, Invert, and Blur.

Filter Divisor

The number in the Divisor is used to re-scale the result of the Filter Array so that it doesn't "overflow." If you run a filter and its result is a mostly white or all white screen, increase the Divisor and try the filter again. (Normally, if the sum of the values in the filter array is greater than one, the divisor should be set to that sum, to normalize the result of the computation (the sum of the values is displayed in the prompt window, at the bottom of the screen, when a filter elevator level is selected.)

Filter Delta

Press on the Delta Button to enter a number from the keyboard to change the brightness of the Filter result. Plus values brighten the result; minus values darken the result.

Filter Modes

The mode buttons determine what components of the image are acted on by the Filter. Only one Mode Button can be on at a time.

all	All components
R	Red only
G	Green only
B	Blue only

Filter Name Button

Displays the name of the current Filter. Press and type in a name to name a custom filter.

Filter Save Button

When you save a filter to disk the Filter Array, the divisor, the Delta, and the filter name are all also saved. Saves to a special type of file for filters.

Filter Recall Button

When you recall a filter from disk the Filter Array, the divisor, the Delta, and the filter name are all recalled. Press on a Filter Elevator level and then press Recall Filter to recall the filter into it.

Filter Clear Button

Press the Clear Button to zero all the boxes in the Filter Array.

Filter Symmetry Buttons

These buttons create symmetric filters if you enter values in just one quadrant of the filter. For example, if your filter values are:

	4	-
3	1	-
-	-	-

Press the 4-way Sym Button to copy the quadrant to the other quadrants:

2	4	2
3	1	3
2	4	2

The Horizontal and Vertical Sym Buttons work the same way, but only horizontally or vertically.

Rotate Filter Buttons

The Rotate <- and Rotate -> Buttons rotate the filter left and right respectively. This is very useful for directional edge filters. For example, take a horizontal line segment enhancement filter:

-1	-1	-1
2	3	2
-1	-1	-1

Rotating this right once gives you a diagonal line segment enhancer:

2	-1	-1
-1	3	-1
-1	-1	2

Rotating once more provides a vertical line enhancer.

The Mirror Filter Buttons

The X Mirror and Y Mirror Buttons simply flip the Filter Array about its horizontal or vertical axis. For example, given this filter:

1	2	3
4	5	6
7	8	9

Using X Mirror results in:

3	2	1
6	5	4
9	8	7

Preview , Active Preview Button s

Press Preview to see a preview of the filter. When the Active Button is on, every change you make on the popup updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the filter on the masked area.

4.15.14 Ripple Button

Ripple gives an refracting effect that looks like distorting glass or water. There must be some image in the Canvas to distort, and Ripple requires a mask. There must be some transparency in the mask, because Ripple works from the variation in the transparency of the mask. Ripple can give extremely interesting results, but it requires some experimentation. Its effects are completely dependent on what kind of a mask you use.

Ripple Popup

Figure 4-105. Ripple Popup

Press the corner button of Ripple to call up the Ripple Popup. The Ripple Slider controls the "refraction index," or intensity, of the ripple effect. It's most powerful at the top.

To ripple an area of the Canvas:

- **Mask the area you want to ripple.**
- **Press the corner button of Ripple.** The popup appears.
- **Move the slider to a high value**.
- **Press OK.** The ripple is performed.

Try using Paint-Mask with an air brush to create a mask with varied transparency to see what Ripple does. Try some different custom-brushes, always with a change in transparency. Programmed brushes give interesting results.

The Preview and the Active Preview Button

Press Preview to see a preview of the ripple. When the Active Button is on, every change you make on the slider updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the ripple on the masked area.

4.15.15 Bump Map Button

This button uses a mask to map out three-dimensional "bumps" with the alpha value of the mask controlling the height. The Direction Button (page 4-59) controls the apparent direction of the light source. There must be some picture information in the Canvas; Bump Map does not have any effect on transparent background. To see the effect of Bump Map, make a mask using Paint Mask using an air brush.

Bump Map Popup

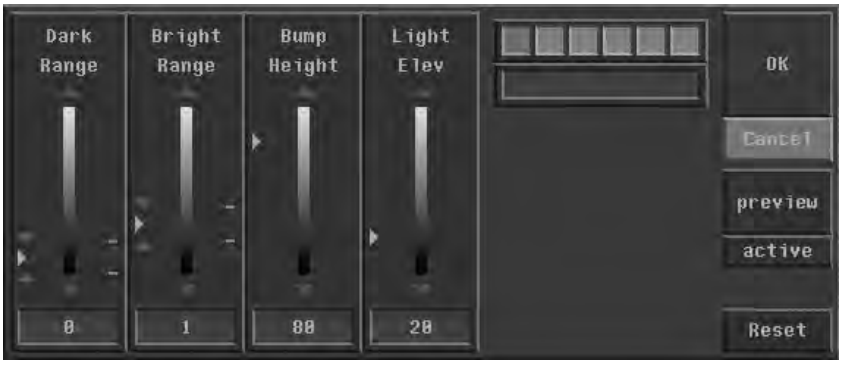

Figure 4-106. Bump Map Popup

Press the corner button of Bump to call up the popup. The popup contains four sliders to control the bump map.

To Bump Map the current mask:

- **Create a Mask with varied intensity.** For example, doing a Luminance Channel Mask on a picture of a cloudy sky gives a mask of varied intensity.

- **Set the direction button to indicate which direction the light source will come from.**

- **Press the corner button of the Bump Map Button.** The Bump Map Popup appears. (You can press the main part of the Bump Map Button to make a bump map without changing the bump map settings.)

- **Press the Reset Button to set the slider scales to their default.**

- **Press OK to render the Bump Map.**

NOTE

A Bump Map often looks best when performed on a solid color background. There must be picture information on the Canvas for the Bump Map to map onto; transparent background won't work.

Dark Range Slider

Sets two markers to define the range of the darker areas of the rendered bumps.

Bright Range Slider

Sets two markers to define the range of the lighter areas of the rendered bumps.

Bump Height Slider

Sets the height of the rendered bumps on a scale of 1 to 100.

Light Elevation Slider

Sets the vertical angle of the light hitting the rendered bumps on a scale of 0 - 90 degrees (coming out of the screen directly at the viewer). The direction clock determines horizontal direction of the light source (in the plane of the canvas image).

Preview and the Active Preview Button

Press Preview to see a preview of the bump map. When the Active Button is on, every change you make on the popup updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the bump map on the masked area.

Elevator Presets

The Bump Map popup has six presets for saving different configurations of bump map settings.

4.15.16 Mosaic Button

The Mosaic Button renders the masked area of the Canvas into blocks for a "digitized" look. You can control the coarseness and fineness of the blocks with two sliders on the Mosaic Popup.

Mosaic Popup

Figure 4-107. Mosaic Popup

Press the corner button of Mosaic to call up the popup. The x slider controls the width of the mosaic blocks; the y slider controls the height. Moving the x slider causes both the x and y sliders to move together. To set separate x and y values, move the x slider first, then the y slider, which operates separately from the x slider. The slider numbers represent the pixel dimensions of the mosaic blocks.

Preview and the Active Preview Button

Press Preview to see a preview of the mosaic. When the Active Button is on, every change you make on the sliders updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the mosaic on the masked area.

Random Button

When highlighted, the mosaic effect is randomized, by varying the horizontal start position of each mosaic block (for example, try an x value of 15 and a y value of 2 with random on for an interesting, impressionist effect).

4.16 Image Tools 2 Panel

Figure 4-108. Image Tools 2 Panel

4.16.1 Edge Button

The Edge function allows you to generate an edge around the masked area in one of 8 directions or in all directions at once. Only elements with some opacity will be edged. Transparent background is ignored by the Edge function. The transparency of the edge is set by the Transparency Slider.

Edge Popup

Figure 4-109. Edge Popup

Press the corner button of the Edge Button to bring up the Edge Popup.

Edge Direction Buttons

The Edge Popup has nine direction buttons. The eight outside direction buttons generate the edge in one direction, and the center button edges out in all directions. If multiple colors are chosen on the palette, they are interpolated through the width of the edge, with the first color on the inside and the last color on the outside of the edge.

Edge Slider Scale

Press and drag to change the length of the edge. Default is a one-pixel edge. The scale goes from 1 to 50.

Style Button

Press the Style Button to turn on/off Style Mode. Normally the center Edge Direction Button edges out in four directions. When Style Mode is enabled, diagonal edging occurs. This results in a more rounded edge.

Edge Reset Button

Press to reset the length of the edge to 1 pixel.

NOTE

The Edge button increases the size of the mask. The mask gets larger by the width of the edge, each time the Edge button is used.

4.16.2 Edge Detection Button

Press to Run Edge Detection on the masked area. The result is rendered to look somewhat like an architectural blueprint by applying white lines to the high-contrast edges it finds in the picture.

You can use Luminance Mask to mask the lines created by the Edge Detection function and put other colors into them or produce varying effects. Once you have used Luminance Mask, use Clamp Mask or Adjust Mask to get rid of noise in the resulting mask.

4.16.3 Tri-Morph Button

Press to display the Triangle Morph Menu, to the left of the Canvas. For more information, see "Line Morph" on page 4-473.

4.16.4 Line Morph Button

When pressed, the Line Morph Menu appears, to the left of the canvas. For information, see page 4-473.

4.16.5 Even Field Button

Press to copy every even field line to every odd field line in the masked area. Reduces vertical resolution by half.

4.16.6 Odd Field Button

Copies odd field lines to every even field line in the masked area. Reduces vertical resolution by half.

4.16.7 Wrap Button

When you press the Wrap Button, the full-screen Canvas image is divided into halves or fourths and is mirrored in X and Y so that the outside edges of the Canvas meet in the center of the screen. This allows you to create continuous backgrounds by painting across the edges, and then un-Wrapping the Canvas, so that the Canvas creates seamless patterns when tiled. Another way to do this is with Fold paint in the Paint Panel.

- Press the main Wrap Button to perform the current Wrap Mode.

Wrap Mode Popup

Figure 4-110. Wrap Mode Popup

Pressing in the inset window in the Wrap Button displays the Wrap Modes Popup which provides horizontal, vertical and 4-way wrapping of the Canvas.

To Wrap and then un-Wrap the Canvas:

- **Press on the inset window in the Wrap Button.** The Wrap Modes Popup appears.
- **Press on the Horizontal Wrap Button to highlight it.** That mode becomes active. The Canvas wraps horizontally.

- **Press on the Horizontal Wrap Button a second time.** The Canvas returns to its un-wrapped form.

- **Repeat with Vertical and 4-way Wrap.**

4.16.8 Motion Tracking Button

When pressed, the Motion Tracking popup appears. For more detailed information, refer to the Motion Tracking section. (See "Motion Tracking" on page 5-206.)

4.16.9 Color Matrix Button

The Color Matrix Button allows you to remap the input RGBA channels to the output RGBA channels. Thus, for example, you can remap the red channel into the green channel.

Press the corner button in the Color Matrix Button to call up the Color Matrix Popup (Figure 4-111). It contains the 16-button Color Matrix. If you press, for example, the button for R in/G out, and enter the number 1.0, the input red channel will be mapped into the output green channel. Values of less than 1.0 provide fractional mapping. Sliders are provided to adjust Bias and Gain, allowing contrast brightness adjustments.

Elevator Presets

The Color Matrix Popup has six presets for saving different configurations of the Color Matrix settings.

Preview and the Active Preview Button

Press Preview to see a preview of the color mapping. When the Active Button is on, every change you make on the popup updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the color mapping on the masked area.

Dither Button

Dither allows you to quantize (reduce or compress) the colors of an image on the Canvas. The effect is similar to how a newspaper photo uses a dot screen of a few colors to give the impression of a much higher color resolution. The Dither tool is similar to the Posterize tool in that it reduces the number of colors on the Canvas image, but Dither provides a greater variety of effects. Its controls are similar to the controls provided for saving color-mapped GIF and TIFF files in the Save As function; see ***"Save File As Button" on page 169***.

To Quantize an area:

- **Mask the desired area on the Canvas.** If there is no mask active on the Canvas, the entire Canvas will be quantized.
- **Press the corner button of the Dither Button to call up the Dither Popup.** The Dither Popup appears. If you press the main part of the Dither Button, the quantizing is applied according to the current settings.
- **Choose Uniform Mode.**
- **Choose both Dither and Noise Modes.** Be sure Greyscale Mode is turned OFF.
- **Press OK.** The quantization is applied into the masked area.

Color Matrix Popup

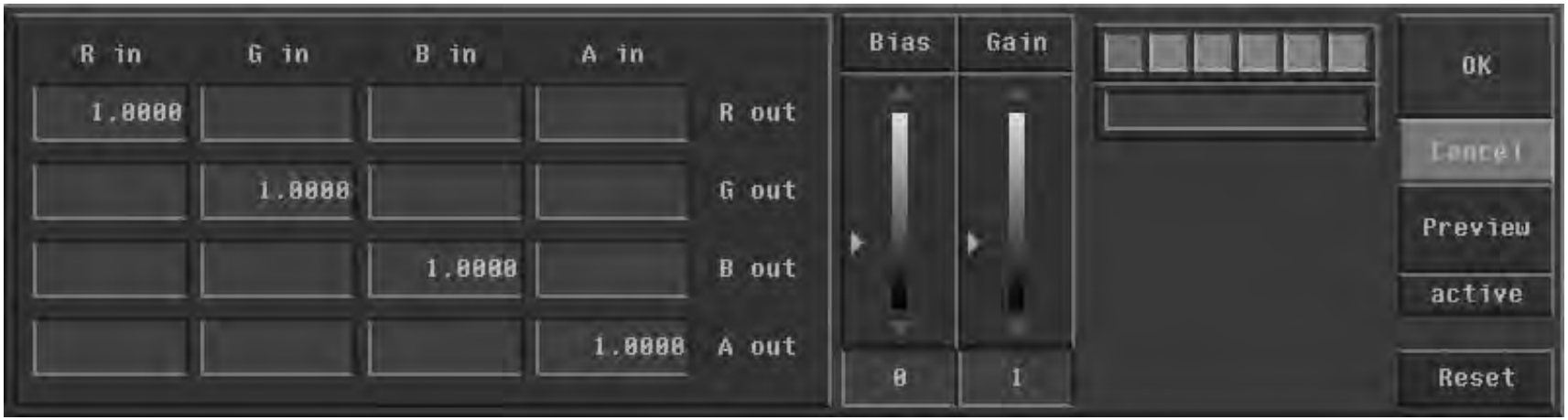

Figure 4-111. Color Matrix Popup

Dither Popup

Figure 4-112. Dither Popup

The Dither Popup (Figure 4-112) contains a host of tools for controlling the application of different kinds of quantization to the Canvas. The two basic modes of quantization are Uniform and Optimal. The Noise and Greyscale Buttons can be on or off for either Uniform or Optimal Mode, but the Dither Mode can't be used with Optimal Mode.

Uniform Mode

Press to activate. Uniform quantization splits the color space into equal partitions.

Optimal Mode

Press to activate. Optimal quantization computes the best color table for the specific image that you're quantizing. Optimal quantization performs very well on most images, even at low levels (few bits per pixel).

Dither Button

When the Dither Button is high-lighted, the quantized image is also dithered. This is the technique used in newspaper photos, where the appearance of higher color resolution is achieved by varying the density of colored dots. Dither only works with Uniform Mode.

The Noise Button

When the Noise Button is high-lighted, some noise is added to the quantized image. This tends to smooth out color-banding artifacts that may appear at lower levels (bits-per-pixel).

Greyscale Mode and the Greyscale Slider

Reduces the quantization to levels of grey. When activated, you can set how many levels of grey using the Greyscale Slider.

RGB Level Sliders

Moving the RGB Level Sliders allows you to set levels of quantization independently for each of the color channels. When the Greyscale Button is on, the RGB sliders are disabled.

Elevator Presets

The popup has six presets for saving different configurations of the settings for quantization.

Preview and the Active Preview Button

Press Preview to see a preview of the quantization. When the Active Button is on, every change you make on the popup updates the previewed image. Pressing Cancel restores the original Canvas image unchanged. Pressing OK performs the quantization on the masked area.

Hints About Dithering

As an example, make a multi-colored gradation on the Canvas. Bring up the Dither Popup, and set the RGB sliders to 2. If Uniform is on, but Dither and Noise are off, the gradation looks banded, since it's being represented with only 8 colors (2 levels of R, 2 levels of G, and 2 levels of B).

If you turn Noise on, however, it breaks up some of the banding, since the values get randomized a bit. If you turn Dither on, the image looks good with no magnification. If you zoom in you'll see that the image's original colors are being simulated by proper distribution of the 8 colors around the image.

You can use Dither and Noise at the same time. If you use the Optimal Button in this same case, Liberty does a better job of choosing the specific 8 col-

ors to use, based on the given image. Uniform uses the same 8 colors for any image. You can't use Dither while using Optimal, however.

Chroma Key Button

The Chroma Key tool provides quick blue screen or green screen chroma keys. It uses the Canvas as a foreground image, from which areas of blue or green screen are keyed out. It uses the image in the current Temp as a background image, which is composited under the keyed-out areas of the canvas (thus replacing the keyed-out blue or green screen areas of the Canvas.)

Using the Chroma Key Popup, you can do previews, pick colors from the blue/green screen, and adjust a variety of controls. Also you can choose a mask as a "garbage matte," to exclude selected areas from the key.

Pressing the main Chroma Key Button performs a chroma key on the Canvas image (foreground) based on the current settings in the Chroma Key Popup.

Chroma Key Popup

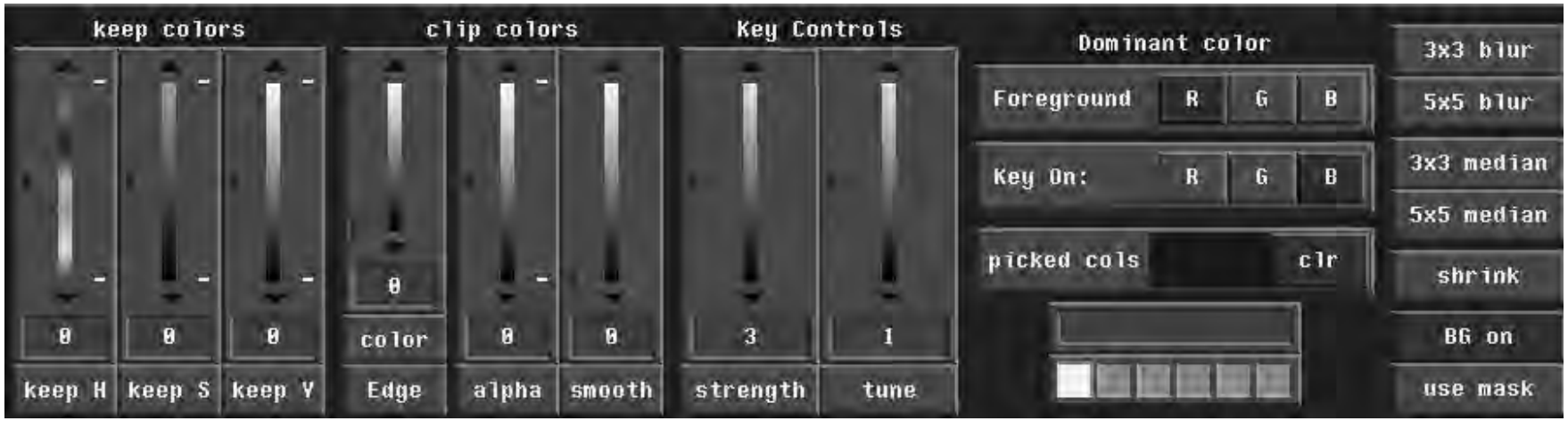

Figure 4-113. The Chroma Key Popup

Press the corner button of the main Chroma Key Button to call up the Chroma Key Popup.

Pressing the OK Button performs a chroma key using the current settings and brings down the popup. The Cancel Button just brings down the popup, and the Reset Button resets most of the settings to default values.

Chroma Key Preview Buttons

The Chroma Key Popup provides three active preview modes, along with a "Preview off" setting. When a preview mode is on, the preview is updated on the screen each time you change settings in the popup. When adjusting the Chroma Key settings, you will often flip between the preview modes. When previews are off, the unaltered Canvas is shown on the screen and, for example, you can Pick samples of the blue or green screen colors (see below, the Picked Color Display).

The Preview Button

The Preview Button previews the image in the Temp (background) composited (keyed) into the blue or green areas of the Canvas (foreground).

The Preview Alpha Button

The Preview Alpha Button previews the alpha (matte) generated by the Canvas chroma key as a gray scale image. A 100% key shows as black; a 100% non-key shows as white. Use Preview Alpha to make fine adjustments in the matte.

Preview BG Button

Preview BG simply shows the contents of the Temp (the image to be used as the background in the key) by itself. Use it to compare the original Temp with the composited result.

Key Adjust Buttons

At the left of the OK button is a stack of buttons to adjust the key signal (matte or alpha) generated by the Chroma Key tool. The Blur, Median, and Shrink buttons are mutually exclusive. Only one can be on at a time.

3x3 Blur Button

Press the 3x3 Blur Button to blur the key signal with a 3x3 pixel filter.

5x5 Blur Button

Press the 5x5 Blur Button to blur the key signal with a 5x5 pixel filter.

3x3 Median Button

Press the 3x3 Median Button to run a 3x3 pixel median filter on the key signal. This is good for removing spots of noise from the key.

5x5 Median Button

Press the 5x5 Median Button to run a 5x5 median filter on the key signal. This is good for removing slightly larger spots of noise from the key.

Shrink Button

The Shrink Button shrinks the key signal at the edges by 1 pixel.

BG On Button

When previewing or performing an actual chroma key, press the BG On Button to turn on/off the compositing of the Temp image with the keyed Canvas. When the BG On Button is on, the Temp is composited with the Canvas. When the BG On Button is off, the background color of the Canvas is keyed in. This is useful for viewing the keyed Canvas against various background colors to see if the blues or greens are still visible. You can change the canvas background color using Liberty's Color Palette (at the left of the Canvas) while the Chroma Key Popup is up, causing the preview to update (if the Preview Button is on) with a different background color displayed in place of the keyed blue or green colors.

Use Mask Button

Sometimes you will want to key out certain parts of the Canvas image other than the blue or green screen areas (for example, booms or rigging). This can be done by masking those areas using Liberty's Mask tools (for example, Rectangle Mask). Then press the button on the popup labeled “Use Mask” to turn it on, which causes any mask currently active on the Canvas to be keyed out. The mask functions as a "garbage matte" in this case. The mask can have transparent areas also (for example, areas with 50% transparency will key out by 50%).

Dominant Color Buttons

Dominant Foreground Color

This selects the color component on the Canvas that you are NOT using for the key. For a blue screen key you would choose "R" (red) or "G" (green).

Thus, you would set the Dominant Foreground Color to red for a blue screen of a person, since the reds in the person's skin tones will contrast with the blue being keyed out.

Key On Button

This selects the color component on the Canvas to be used for the key. For example for a blue screen key you would choose "B" (blue).

Picked Color Display

The Picked Color Display is always active when the Chroma Key Popup is up - at any time you can "pick" a key color by pressing in the blue or green areas of the Canvas. This fine tunes how much blue or green keys out from the Canvas. When you pick blue or green colors from the Canvas, the colors are added to the color swatch labeled "picked cols," which displays the range of colors being keyed out. The "clr" button clears the picked colors and resets the swatch to a default color sample.

Chroma Key Settings Elevator

The Chroma Key Popup contains a 6-level elevator that allows you to set up and save 6 sets of parameters. You can name each level using the text window above the elevator.

Chroma Key Control Sliders

Strength Slider

The Key Control Sliders include the main chroma key control tool, the Strength Slider, near the middle of the popup. The Strength Slider controls how much blue or green is keyed out. The higher the slider, the more blue or green is keyed out.

Tune Slider

The Tune Slider provides a secondary strength control. Although you will often leave it at a value of one, a higher value causes more blue/green to be keyed out, while a lower value causes less blue/green to be keyed out. Its effects are slightly different from the Strength Slider and allows more fine tuning of the key.

Clip Colors Sliders

The Clip Colors Sliders provide additional ways to adjust the chroma key.

Alpha Slider

Use the Alpha Slider, with two slider markers, to clip the key signal at the upper and lower ends. Lowering the upper marker increases the opacity of the most opaque areas of the key (matte). This will make semi-transparent areas of the Canvas more opaque (less keyed). This is useful when you want to keep those areas in the picture. Conversely, increasing the lower marker of the slider makes the most transparent parts of the key totally transparent. Use this to clip out undesired parts of the Canvas which are still visible but have high transparency.

Smooth Slider

The Smooth Slider, next to the Alpha Slider, makes the Alpha clipping effect smoother. In other words, increasing its value makes the edges of the matte softer when you're using the Alpha Slider (actually, it only applies to the lower marker of the Alpha Slider).

Color Slider

Use the Color Slider to neutralize or adjust out the keyed color (blue or green) if it still appears in the composited picture. For example, if blue still appears on the composited result of a blue screen, increasing the Color Slider reduces the blue color component in those areas.

Edge Button

The Edge Button, below the Color Slider, limits the Color Slider's effect to transparent areas of the key. Thus, when the Edge Button is on, the Color Slider has no effect on opaque areas of the key. In practice this removes blue or green at the edges of the key.

Keep Colors Sliders

Use the three Keep Colors Sliders to preserve certain colors in the Canvas image that would otherwise be keyed out. Each slider has two markers.

Keep H (Hue) Slider

Use the Keep H Slider to keep certain hues in the Canvas from keying out. For example, in a blue screen Canvas, you may want to keep certain areas of cyan from keying out. Adjusting the Keep H Slider so that the bottom marker is at the beginning of the cyan's range and the top marker is at the end of the cyan's range will preserve that range of colors in the Canvas. The Keep H Slider defaults to 0 for the bottom marker and 255 for the top marker; i.e., the slider has no effect.

Keep S (Saturation) Slider

The Keep S Slider is similar to the Keep H Slider, except that the bottom and top markers work independently. For example, if you want to keep the

least saturated colors in the Canvas from being keyed out, you can raise the bottom marker of the Keep S Slider, to 20 for example. This will keep all pixels whose saturation is less than 20. Likewise, the top marker allows the user to preserve very saturated colors. For example, moving the top marker of the Keep S Slider down to 100 will keep all pixels whose saturation is more than 100.

Keep V (Value) Slider

The Keep V Slider works in a similar fashion for value. Raise the bottom marker to keep dark colors from keying, and lower the top marker to keep bright colors from keying.

Ultimatte Plug-in

Note that Liberty supports an Ultimatte Cinefusion plug-in as part of the Animation Environment. This plug-in provides a far more advanced set of controls for blue and green screening than the Chroma Keying tool described here. Thus, the user may prefer to purchase and use the plug-in for the more difficult or intensive chroma keying jobs.

Plug-in Button

Liberty's Plug-in function allows you to use filters created by third-party software developers. These filters may need to be licensed separately by contacting your Chyron Liberty sales representative.

Pressing either end of the Plug-in Window toggles through the list of available plug-ins. Pressing the corner button brings up the Plug-in Popup.

At the right end of the Plug-in Popup is a toggle button (< >) that allows you to go through a list of available filters. The name of the current filter appears in the bottom window of the stack just at the left. The upper windows in that stack display available options, if any, for that specific filter. Some of the sliders at the left of the popup may be activated for a filter, allowing you to modify the filter's output. A slider that is active for any given filter displays a label for the function you can change.

Press the OK Button to render the filter on the Canvas (or masked area of the Canvas).

Plug-in Popup

Figure 4-114. Plug-in Popup

4.17 MASK TOOL FUNCTIONS

The current mask tells the system what part of the Canvas you want to work on. The mask tool functions allow you to create and adjust masks. You can mask the entire Canvas, or an area as small as one pixel. You can create masks of variable transparency. You can combine different Mask functions at once. With the Invert Prefix Button and a Mask function you can un-mask areas. The transparency of masks are controlled by the setting of the Transparency Slider when the mask is created.

After a mask is created using a mask tool, the mask becomes active (on). All currently masked areas are acted on by the next Canvas operation (painting or pasting an image to canvas, for example.) When the Canvas operation is complete, the mask becomes inactive (off).

Mask Buffer in the Buffers Panel

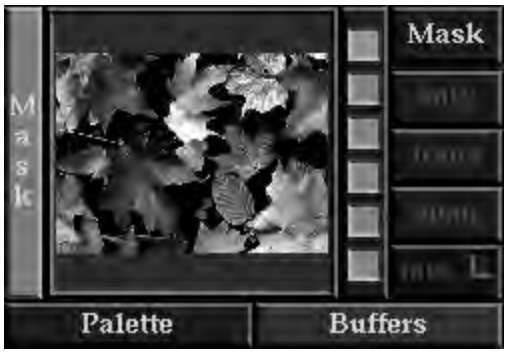

Figure 4-115. Mask Buffer in the Buffers Panel

At any time there can be one mask on the Canvas which includes all the masked areas. The current mask is displayed in a small thumb-nail black-and-white picture in the Mask Buffer in the Buffers

Panel at the left of the Canvas. The Buffers Panel contains a Mask Elevator which contains six different masks (including the current one.) You can also store masks on the disk using the Save Button. The Mask Buffers Panel also contains the Mask Display functions, with which you can change the color/ transparency/mode in which masks are displayed on the Canvas when active. For more details on the Mask functions in the Buffers Panel, see the section on the Buffers Panel, page 4-74.

Saving and Recalling Masks

To save a Mask to disk:

- **Use a Mask Button to mask an area of the Canvas.**
- **Press the Save Button (in the Transfer panel).** The File Popup appears.
- **Press either end of the File Mode Button until it displays the word "Mask" (the file button is the pink button labeled “Canvas” when the file popup first comes up.)**
- **Type a file name for the Mask to be saved under, followed by the keyboard's Enter key.** The Mask is saved with a yellow color-coded dot next to its file name in the file list. When browsing files in the Full-Screen File Menu, masks appear as white silhouettes on a black background.

To recall a Mask:

- **Press the Recall Button.** The File Popup appears.
- Press either end of the File Mode Button until it displays the word "Mask."

- **Press on a file name in the file list, or type the file name to be recalled, followed by the keyboard's Enter key.** The file is recalled to the Canvas as an active mask.

NOTE

It doesn't matter whether the file you recall was saved as a Mask file or not. A normal picture file, when recalled in Mask mode, displays as a Mask rather than as an RGB picture.

When the Invert Prefix is on, the Mask function will remove mask from the areas it would normally add mask to.

Mask Panels Description

There are two Mask Panel menus, Mask Tools 1 and Mask Tools 2. Press the small arrows at either end of the yellow title bar at the top of the panel to bring up the other panel. Normally the Mask Panel appears in the rightmost of the four Panel menu positions under the Canvas. The top row of four buttons - Use mask, Mask All, Invert Mask, and Erase Mask - stay visible when both the Mask1 and the Mask2 Panels are displayed.

Temp Layers as Source for Mask Tools

The Mask Panel has a Canvas/Temp Mode bar at the top. Mask Tools that in Canvas Mode use the Canvas as their source (such as Alpha, Channel, Fill, and Match) use the current Temp as their source when Temp Mode is active. For example, if you toggle to Temp Mode, you can use Channels/Luminance Mask to generate a mask from the luminance of the current Temp.

When the current Temp is not enabled as a layer, the mask is generated from the in-place position of the current Temp. When the current Temp is an active layer, the layer offset is used to generate the mask. This is true for Alpha, Channel, Match, Diff and Paste Mask (Fill Mask requires that the layer be active).

4.18 Mask Tools 1 Panel

Figure 4-116. Mask Tools 1 Panel

4.18.1 Use Mask Button

The Use Mask Button lights up when a Mask is active to show the presence of an active Mask. Always check the Use Mask Button if you want to see if a mask is active. When the Use Mask Button is high-lighted (a mask is active), you can de-activate the current mask by pressing the Use Mask Button to turn it off. The current mask will be remembered until replaced by a new mask. When no Mask is active, you can press the Use Mask Button to turn on the last, or previous, mask.

4.18.2 Mask All Button

Press this button to mask the entire Canvas with a 100% mask.

4.18.3 Invert Mask Button

Press the Invert Mask Button to invert the mask currently displayed on the Canvas. Areas that are 100% masked become 0% masked, and vice-versa. If nothing is masked, it then masks all areas.

4.18.4 Erase Mask Button

Clears or erases the active Mask.

4.18.5 Rectangle Mask Button

Use the Rectangle Mask Button to create a rectangular masked area on the Canvas. This is often the quickest way to mask part of the picture. Rectangle Mask has four modes that you access through the text window in the Rectangle Button: Rectangle, Square, Gradated Rectangle, and Gradated Square.

To mask a rectangle:

- **Press the Rectangle Mask Button.**
- **Press down once on the Canvas to set the first corner of the rectangle.**
- **Move the pen and press down again to set the opposite diagonal corner of the masked rectangle.** The rectangle is masked and high-lighted. As you drag the pen, the rectangle is displayed by a moving, elastic wireframe rectangle. Pressing the button on the pen's barrel (if present), or

pressing the middle mouse button, breaks contact with the wireframe rectangle and lets you start a new rectangle. Mask as many rectangles as you like.

When there is an active mask on the Canvas, turning on Rectangle Mask allows you to add rectangles to the existing mask.

NOTE

When the mask is not active, turning on rectangles erases the mask before allowing you to add rectangles.

Use the Invert Prefix with Rectangle Mask to un-mask rectangles in the current mask.

Rectangle Mask Modes

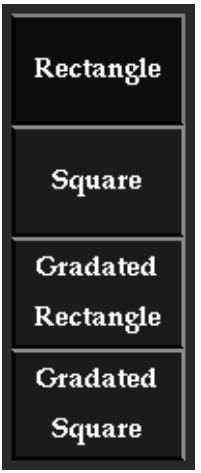

Figure 4-117. Rectangle Mask Popup

Press the middle of the window in the Rectangle Mask Button to call up a popup of the four Rectangle Mask Modes. Press on the mode you want to use.

Rectangle Mask

Press to mask a rectangle.

Square Mask

Press to mask a square. Otherwise the same as Rectangle Mask.

Gradated Rectangle Mask

Creates a rectangular mask with gradated alpha (transparency). The masked rectangle gradates from the current value of the Transparency Slider to 0 alpha, with the direction of the gradation depending on the Direction Button (see page 4-59).

NOTE

Rectangular and square masks can also be created in the Shape Popup; see page 4-262.

Gradated Square Mask

Creates a square mask with gradated alpha (transparency). The masked square gradates from the current value of Transparency Slider to 0 Alpha, with the direction of the gradation depending on the Direction button (see page 4-59.)

4.18.6 Circle Mask Button

The Circle Mask Button replaces the current mask with an ellipse-mask that is determined by the current mask's bounding box. Creates an exact circle if

the current mask is a square (see Square Mask, above). If there is no mask currently active, Liberty uses the edges of the screen as boundaries.

NOTE

Circular masks can also be created in the Shape Popup, see page 4-262.

4.18.7 Alpha Mask Button

The Alpha Mask Tool creates a mask from the Canvas's alpha information (how opaque the areas are). If a pixel is 100% opaque, it is 100% masked. If a pixel is 50% opaque, it is 50% masked.

NOTE

When a pixel that is 50% opaque is alpha-masked, it is masked 50%. Thus if that pixel is Cut into a Temp, the pixel that goes into the Temp is 25% opaque. Alpha Mask is a good way to eliminate low-opacity noise that may appear in the background of an image masked from a video-captured picture.

Press the Alpha Mask Button to create a mask from the alpha (transparency) of the image on the Canvas. Background color is not masked. If no mask is on, then all elements on-screen are alpha-masked. If there is a mask on-screen, only elements within the mask are Alpha-masked.

Press the Invert Prefix Button, then the Alpha Mask Button to invert the alpha data before making the mask (though background color is still not masked).

Alpha Mask Popup

Figure 4-118. Alpha Mask Popup

Press the corner button of the Alpha Mask Button to call up the Alpha Mask Popup. The Alpha Mask Popup contains the Diagram Curve. The Diagram Curve re-maps the current mask values according to its shape. For example, increasing the slope of the curve makes the mask more opaque.

For information on how to modify the Diagram Curve, or on how the Diagram Curve operates with masks, see page 4-371.

4.18.8 Adjust Mask Button

Figure 4-119. Adjust Mask Modes

The Adjust Mask modes adjust the current active mask by a user-defined number of pixels.

Press in the text window in the Adjust Mask Button to see all seven modes. Press on one of the modes to make it active.

The seven Adjust Mask modes are:

Blur Mask Mode

Blurs the active mask by the designated number of pixels on all edges. This mode is useful in anti-aliasing edges on a mask.

Gaussian Blur Mask Mode

Gaussian Blur provides a smoother and cleaner curve-weighted blur effect than the standard, faster Blur Mode.

Median Mode

Averages masked pixels with their neighbors. Has the effect of eliminating “grainy” noise in a mask.

Grow Mode

Make the active mask grow by the designated number of pixels on all edges.

Shrink Mode

Make the active mask shrink by the designated number of pixels on all edges.

Contour Mask Mode

Traces the outside contour of the active mask using a width of the designated number of pixels. This mode has the effect of making a "ring" around the active mask on all edges. "Grows" the mask when making the ring.

Inside Contour Mode

Same as Contour Mode, but traces the inside contour of the mask using the designated number of pixel. "Shrinks" the mask when making the ring.

To adjust the current mask:

- **Press the corner button of the Adjust Mask Button to bring up the popup.**
- **Press on one of the mode buttons to make it active and set the number of pixels with the slider.**
- **Press the Preview button to preview the effect of the Adjust before it becomes permanent.**
- **Press the OK Button.** The adjustment to the mask is completed.

Adjust Mask Popup

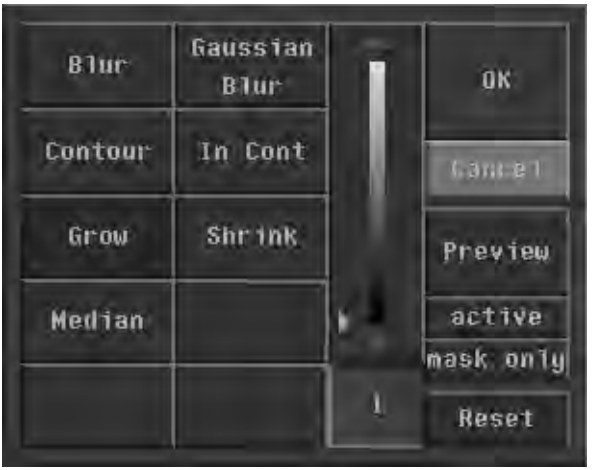

Figure 4-120. Adjust Mask Popup

The Adjust Mask Popup has seven mode buttons and a vertical slider that controls the number of pixels used for the adjustment. The Preview Button allows you to see the mask adjustment before it is made permanent. The Active button leaves the preview mode activated continuously. The Mask Only Button displays the mask as an opaque white-on-black silhouette. The Reset button resets the slider to a default value of 4.

Mask Channels Button

Figure 4-121. Mask Channel Modes

The Mask Channels Button uses the Diagram Curve to crease a mask from one of the following channels of the Canvas:

Lum Create Diagram from luma component only.

R Create Diagram from the red component only.

G Create Diagram from the green component only.

B Create Diagram from the blue component only.

H Create Diagram from the hue only.

S Create Diagram from the saturation only.

V Create Diagram from the value (brightness) only.

The current channel selected is displayed in the mask channels text window (on the Mask Channel button.) Pressing on this window brings up a pop-up, allowing the user to switch channels.

Press the Mask Channels Button to create a mask from the selected channel of the Canvas (printed in the Mask Channels window.) If a mask is already

active when the channel mask is created, the channel mask is affected by the active mask (the channel mask is attenuated by the active mask's transparency.).

Mask Channels can also be used in conjunction with the Add and Invert Prefix Buttons. When the Add Prefix button is on, and a mask is active when the channel mask is created, the channel mask will be added to the existing mask (rather than be attenuated by it.) Pressing the Invert Prefix first masks the opposite pixels of the current Channel.

Mask Channels Popup

Press the corner button of Mask Channels to call up the Mask Channels Popup (***Figure 4-122***). The Mask Channels Popup contains the Diagram functions and buttons for choosing among the different channel options. When a channel is highlighted, the Diagram Curve is displayed in the appropriate colors: for instance, Luminance shows a Diagram Curve ramped from black to white and Hue shows a Diagram Curve ramped through the primary colors.

S Limits & V Limits Sliders

The "S limits" and "V limits" sliders are utilized when the Mask Channels tool is in Hue ("H") mode (creating a mask based on the Hue of the source image). The sliders are disabled when the Mask Channels tool is not in Hue mode. The V slider allows the user to further tune the mask, by preventing pixels with very light or very dark colors from being masked. Increasing the lower marker on the V slider (which defaults to 0) prevents all pixels with brightness lower than the marker from being masked. This is especially useful since dark pixels don't have a well-defined hue, and are often masked

when you don't want them to be. Raising the lower marker of the V slider prevents this. Lowering the upper V slider (which defaults to 255), prevents all pixels with brightness higher than the marker from being masked. Thus, the upper and lower markers on the V slider work independently.

The S slider works in a similar manner to the V slider, but using Saturation rather than Brightness.

Channels Clamp Button

Clamping allows you to precisely control what values of the channel you apply mask to. For instance, if you want to separate a camera-grabbed black logo from its white background, you use the luminance channel and clamp all the white and light gray values found in the background to 100% and create the mask only from those values. Once the mask is created, Erase will remove all of these lighter areas, leaving only the darker grays and black. (See page 4-14 for more information about the Erase button.)

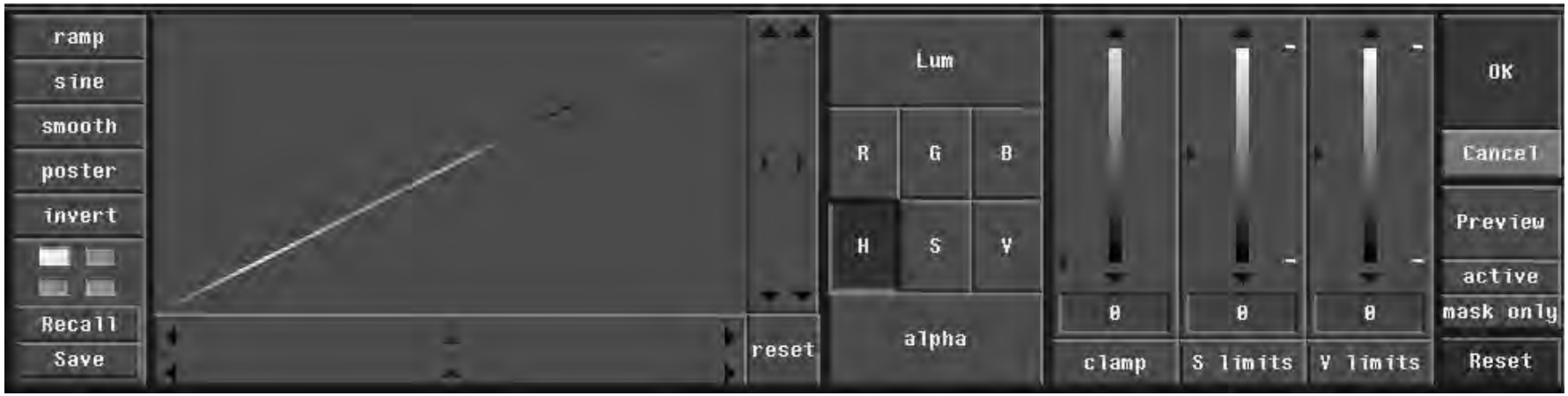

Figure 4-122. Mask Channels Popup

The Clamp Button is used to clamp the chosen values in the Diagram Curve to 100% or zero, leaving nothing in between. Press on values in the Canvas to choose them (the Pick Colors Button is automatically activated by the Mask Channels Popup), then clamp them to 0 or 100% on the Diagram Curve.

To clamp chosen values from the Canvas:

[ ] 1. **Press the corner button of the Mask Channels Button.** The Mask Channels Popup appears.

[ ] 2. **Press on the channel button you want to use.** (Luminance, Red, Green, etc.)

[ ] 3. **Press the Ramp Button on the Diagram Curve to reset the curve, if necessary.**

[ ] 4. **Press on the areas of the Canvas that you want to mask.** The corresponding areas of the Diagram Curve are marked.

[ ] 5. **Press the Clamp Button**. The marked areas on the Diagram Curve are clamped to 100% and the rest of the values are clamped to 0.

[ ] 6. **Press the Preview Button to see a preview of the masked areas.** It may help to use the Mask Only button (below the Preview button). This displays the mask in opaque white-on-black, making it easy to evaluate the mask as you adjust and preview it.

[ ] 7. **Press the OK Button to confirm the mask.** The Mask Channels Popup disappears. Now you perform the desired operation on the masked area; for instance, Erase, or Apply Color, etc.

Clamp Tolerance Slider

Determines how much of the marked diagram curve is clamped. If the slider is at minimum value (all the way to the bottom), only the exact marked parts of the curve are clamped to 100%. If the slider is at maximum value (all the way to the top), all parts of the curve between the lowest and highest picked parts are clamped to 100%. At values between minimum and maximum, more or less of the curve is clamped. The Reset Button resets the slider to minimum.

Preview Button

Press the Preview Button to see a preview on the Canvas of the result of the current re-mapped Diagram Curve. Use the Mask Only button which shows the mask in white on black, making it very clear what your mask consists of.

Active Button

Press the Active Button to turn it on/off. When Active is on, the preview of the result is updated continuously (every time you change the Diagram Curve).

OK Button

Press the OK button to bring down the popup and make the change to the current mask.

Cancel Button

Press the Cancel button to close the popup and not make any change to the current mask.

4.18.9 Fill Mask Button

Figure 4-123. Fill Mask Modes

The Fill Mask Button allows you to create a mask by mask-filling an area of the Canvas based on transparency, color, or an existing mask. You can transparency-fill an object on the screen if it is surrounded by transparent background. The different fill modes use slider scales to set the thresholds at which the fill will stop.

Press in the text window in the Fill Mask Button to display a list of all three modes. Press on one of the modes to make it active.

Press the corner button in the Fill Mask Button to call up the Fill Mask Popup.

Fill Mask Popup

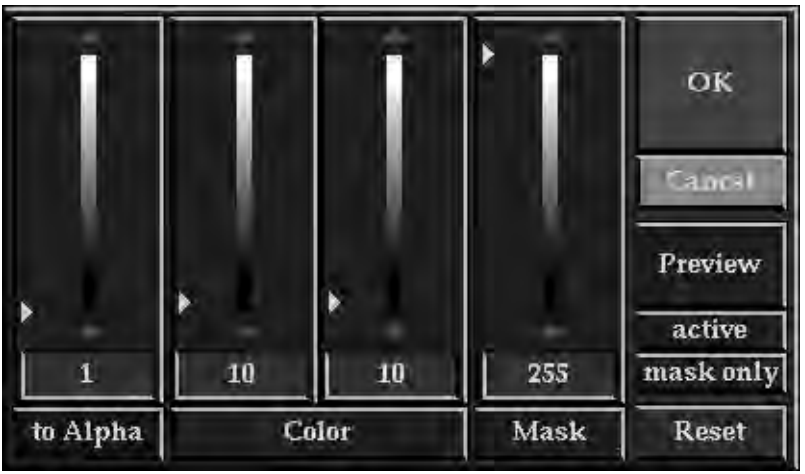

Figure 4-124. Fill Mask Popup

The Fill Mask Popup has four slider scales: one for filling to alpha, two for filling to color, and one for filling to mask.

Fill to Alpha

To fill-mask to transparency, press on the Fill to Alpha Slider and set it, then press the OK Button. Press on the Canvas. If the place that you pressed has a lower alpha value than the slider, the mask fills outward from the pixel, stopping at pixels with an alpha equal to or greater than the slider setting. If the place that you pressed has a higher alpha value than the slider, mask fills outward from the pixel, stopping at pixels with an alpha equal to or less than the slider setting. To fill to empty background color (zero alpha) set the Fill to Alpha Slider to the bottom, or 1 (one). The default slider setting for Fill to Alpha is 1 (one).

Fill to Color

To fill-mask to a color, press on one of the Fill to Color Sliders and set it, then press the OK Button. Press on a Pixel on the Canvas. Mask fills outward from the pixel, stopping at pixels whose color differs from the start pixel.

The left Color Slider is the Greed Slider, which determines how much of a color difference the fill stops at. The higher the setting of the Greed Slider, the greater the difference of colors that are included in the fill.

The right Color Slider is the Smoothness Slider, which determines the softness of the edges of the fill. If the Smoothness setting is 0, the edges are hard without anti-aliasing (all filled values are 255). If the Smoothness setting is at the maximum (same as Greed setting), the fill has a smooth edge.

Fill to Mask

To fill-mask to a mask value, use Paint On Mask (or other mask tool) to make a closed mask on the Canvas (for example, Paint-masking a boundary around an image you want to cut out from its background). Press on the Fill to Mask Slider and set it, then press the OK Button. Press on a pixel on the Canvas inside the boundary of the closed mask. Mask fills out to the masked boundary. The mask fills with the value chosen on the slider.

Fill Mask Preview

Press Preview to see the fill before it becomes permanent. Press on Preview, then anywhere on the Canvas to see a preview of that fill. The Preview Button will only preview one fill at a time. Press again on the Canvas to choose a new start point for the fill and re-preview it. The Mask Only Button dis-

plays the mask as an opaque white-on-black silhouette. Previewing a Fill Mask is important when filling to a threshold - you can set a threshold with a slider, preview the mask, then come back and adjust the slider and re-preview. Press the OK Button to make the previewed mask permanent.

Fill Mask Active

Press the Active button to turn it on or off. When Active is on, the preview of the result is updated continuously.

4.18.10 Match Mask Button

The Match Mask Button makes a mask based on matching the Canvas colors to the color chosen on the palette. Sliders on the popup allow you to adjust what colors are masked.

The button's text window shows whether the button is in Hue or RGB mode. Press on the text window to bring up a pop-up selecting one of these modes.

Match Mask Popup

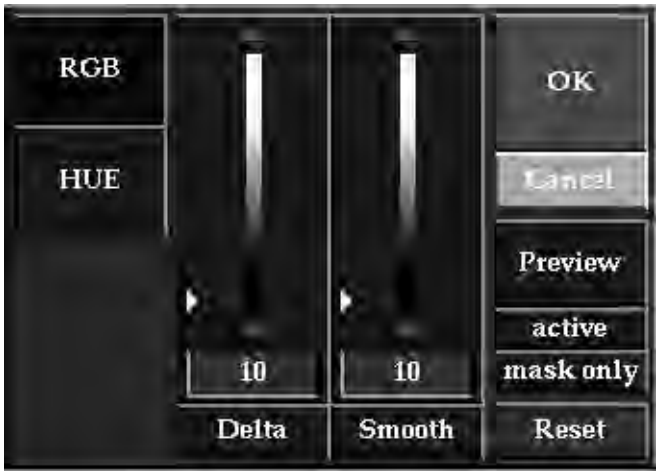

Figure 4-125. Match Mask Popup

Press the corner button of Match to call up the Match Mask Popup. The popup contains two sliders: the Delta Slider, and the Smoothness Slider.

The Delta Slider sets a "greed" factor for the color mask. If its setting is low, then only the nearly exact instances of the current palette color are masked on the Canvas. If it is set high, then Canvas colors are masked that are similar to the current color.

The Smoothness Slider sets how hard-edged or soft-edged the mask is. A high Smoothness setting results in a softer-edged mask.

To adjust the Delta factor and make a Match Mask:

[ ] 1. **Choose a color in the palette** (or use Pick Color)**.**

[ ] 2. **Press the corner button of the Match Button.** The popup appears.

[ ] 3. **Adjust the Delta Slider.** The higher the Delta value, the more is masked.

[ ] 4. **Adjust the Smoothness Slider.** The higher the Smoothness Slider, the smoother the edge of the masked area. The Smoothness value is constrained to be no higher than the Delta value.

[ ] 5. **Press the Preview Button to preview the effect of Match Mask before it becomes permanent.**

[ ] 6. **Press the OK Button.** The mask is made.

Match RGB and Hue Buttons

Press one of these mode buttons to turn it on. RGB is the default. Hue works the same as RGB, except that the match is based on hue only; saturation and brightness are disregarded. This tends to leave highlights and shadows unmasked.

If a mask is already active when Match Mask is invoked, the result will be limited to the opaque areas of the active mask.

With the Add Prefix on, Match adds the new Mask to any existing active mask.

With the Invert Prefix on, Match inverts the mask.

4.19 Mask Tools 2 Panel

Figure 4-126. Mask Tools 2 Panel

The Mask Tools 2 Panel has the same top row of buttons as the Mask Tools 1 Panel: Use Mask, Mask All, Invert (Complement) Mask, and Erase Mask.

4.19.1 Safe Title Button

Safe Title is a way to display a white rectangular overlay on the picture to indicate the area outside of which it is not safe to put essential visual information in the picture. The white rectangle is not really part of the picture and will not appear when Cut, recorded or saved to disk. Press the Safe Title Button to turn on/off the white rectangle. Press the corner button of the Safe Title Button to call up the Safe Title Popup.

Safe Title Popup

Figure 4-127. Safe Title Popup

The Safe Title Popup provides two sets of sliders that define the Safe Action and Safe Title fields. You can change the size of the rectangles with the slider scales; below the sliders, the aspect ratio (ratio of width to height) of each rectangle is displayed. (These sliders allow the X and Y size of the rectangle to be set, in terms of percentage of the Canvas size.) Pressing the Reset button resets the sliders to SMPTE Safe Title and Safe Action fields, based on the current canvas resolution. The Safe Title Elevator stores six different settings.

Show Safe Action and Show Safe Title

To turn on the Safe Action or Safe Title rectangle, press the corresponding Show Button. A white, centered cross-hair appears with either of the rectangles. Press OK to make the Safe Title Popup disappear. The Safe Title Button remains highlighted. Press the Safe Title Button again to turn it off or press the corner button to bring up the popup again and turn off the Show Buttons. The white rectangle is not

permanent, nor is it really a part of the picture. You can leave it up while you work on the Canvas - when you save pictures the overlay is not saved.

Mask Safe Action and Mask Safe Title

You can create a rectangle mask corresponding to Safe Action or Safe Title by turning on Mask Safe Action or Mask Safe Title. If either or both of the Mask Buttons is on when you press OK, the solid rectangle masks are maintained on the Canvas for the next function.

Cross Hair Button

The Cross Hair Button changes the size of the crosshair in the center of the screen, when either Show Safe Action or Show Safe Title is on.

4.19.2 Mask Grid Button

Press the Mask Grid Button to display the current grid as a mask in one-pixel lines, thus making it visible. You can then Apply color into the grid lines to make them a permanent part of the picture. The Mask Grid Button displays the current Grid whether the Grid Button is actually turned on or not. For more details about Mask Grid, see page 4-58.

4.19.3 Clamp Mask Button

The Clamp Button allows you to "compress" the values in a mask. Press the corner button of the Clamp Button to call up the Clamp Popup. The Clamp Popup has the standard Diagram tools along with an extra slider, the Clamp Threshold Slider. Basically, clamping a mask reduces some of the mask values to either 0 or 100% (255). Clamp sets to 0 all current mask values that are lower than the

Clamp Threshold Slider Scale setting, and sets to 255 all current mask values equal to or greater than the slider setting. Useful for eliminating anti-aliasing. Press in the Clamp Window to choose between two different modes of affecting the Diagram: Snap Mode and Ramp Mode.

Snap & Ramp Modes

Figure 4-128. Snap and Ramp Modes

Snap Mode

In Snap Mode all values less than the slider setting are set to zero. All values greater than the slider setting are set to 255. With the Invert prefix on, this is reversed.

Ramp Mode

In Ramp Mode all values less than the slider setting are set to zero. All values greater than the slider setting are unchanged. With the Invert Prefix on, this reversed.

Clamp Mask Popup

Figure 4-129. Clamp Mask Popup

Press the corner button of Clamp to call up the Clamp Mask popup. The Clamp Mask Popup consists of the Clamp Threshold Slider, a preview, a Mask Only Button and OK, Cancel, and Reset Buttons, along with a diagram.

Diagram with Clamp Mask

Re-maps the current mask values according to the diagram, completely ignoring the Clamp Threshold Slider. For information on how to modify the Diagram Curve, see page 4-290. For information on how the Diagram Curve operates with masks, see page 4-371.

4.19.4 Difference Mask Button

Press to make a mask on the Canvas based on the difference between the picture in the Canvas and the picture in the Temp Buffer. Differences create a mask on the Canvas corresponding to the difference. The difference can be based on various channels;

i.e., on luminance differences, on red differences, etc. The channel displayed in the window in the Difference Button is the active channel. The more different the pixels, the higher the mask values.

Difference Mask Modes

Figure 4-130. Difference Mask Modes

The window in Difference displays the current mode. Press directly on the mode label to call up a popup displaying all the mode buttons. The mode buttons also appear on the Difference Popup (the corner button of Difference). You can base a Difference Mask on Luminance, Red, Green, Blue, Hue, Saturation, Value, or Alpha (transparency). Press on the desired mode button in the popup and press the OK Button. You can cycle through the modes by pressing on either end of the window in the Difference Mask Window.

Difference Mask Popup

Press the corner button of the Difference Mask Button to call up the Difference Mask Popup (***Figure 4-131***), which contains the Diagram Curve, the Difference Ramp and Clamp functions, and related features. The Diagram Curve re-maps the current mask values according to the diagram, completely ignoring the Difference Ramp/Clamp functions. For information on how the Diagram Curve operates with masks, see page 4-371.

The popup also contains the Difference Mask Modes.

Figure 4-131. Difference Mask Popup

Difference Ramp and Clamp Functions

These functions allow you to apply ramping and clamping to the Difference Mask, as defined by the Diagram Curve. They consist of a slider scale and two mode buttons, Ramp and Clamp. When Clamp Mode is on, all values above the slider are clamped to 255 and all other are clamped to 0. When Ramp Mode is on, all the values above the slider are ramped, and all others are clamped to 0.

4.19.5 Field Mask Button

Figure 4-132. Field Mask Modes

Press the Field Mask Button to mask every other one-pixel line on the Canvas. In Odd Mode it masks the odd field; in Even Mode it masks the even field.

The text window displays the current mode (even or odd.) Press on the text window to bring up a popup for selecting even or odd mode.

4.19.6 Paste Mask Button

Figure 4-133. Paste Mask Modes

Press to mask an area by pasting the contents of the Temp Buffer as a mask. An area is masked on the Canvas determined by the silhouette of the contents of the Temp Buffer. Any transparency in the image in the Temp Buffer also appears in its mask. The two Paste Mask Modes are: In-place and Pick Point. In-place pastes the mask in its original position; Pick Point gives it to you on the end of the pen (or mouse) for manual positioning. In this mode, a full-resolution preview of the mask being pasted is updated on the canvas as the user moves the pen.

The current mode is displayed in the Paste button's text window. Press on the window to bring up a popup selecting this.

Invert Prefix with Paste Mask

Pressing the Invert Prefix Button, then pressing Paste Mask uses the temp's Alpha data to erase from the existing mask.

4.20 TEXT PANEL MENUS

The Text Panel Menus provide Liberty's text functions. Liberty uses three Panels for the Text functions: one for the main text editing, another for Accent Marks, and one for International Characters. Press the small arrow at either end of the light blue Text title bar (at the top of the Text Panel) to cycle the Accent Panel and the International Panel.

All Liberty fonts are Bitstream vector fonts. Liberty comes with 50 standard fonts. Contact your Liberty salesperson to order additional fonts from the library of over 1,500 fonts.

4.20.1 Text Panel

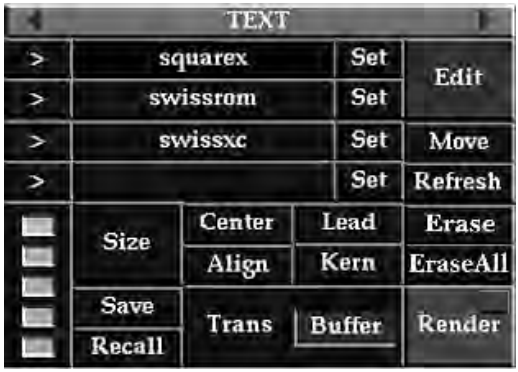

Figure 4-134. Text Panel

Text Edit Button

Press the Edit button to begin entering text from the keyboard, or to edit existing text. As you type, the text appears on the Canvas in vector outline form. A

small triangle appears at the base of the characters that represents the insertion point. Press the Edit Button a second time to terminate Text Editing.

THE TEXT EDIT BUTTON MUST BE ON IN ORDER TO USE ANY OF THE TEXT EDITING FUNCTIONS!

Selecting Text

When the Text Edit Button is on, you can select displayed text by pressing and dragging the pen over the text outline on the Canvas. The selected text turns red. Most text functions use selected text (these turn off the selection when complete.)

To unselect the selected text, press on the Canvas away from the displayed text.

Font Elevator

In the upper left of the Main Text Panel Menu is the Font Elevator. It has four levels, each of which can hold a different font.

To bring a font into a level, or to change the font in a level:

- **Press on the in-arrow at the left of the elevator level.** The File Popup appears. If the font directory is not displayed, press on DIR to see a list of directories; press the directory named "fonts." You can browse fonts just like pictures in the Full Screen File Menu.

- **When the list of available fonts is displayed, press on a font name in the list.** The name of the font appears in the elevator level and the File Popup disappears.

On the right of each elevator level is a Set button. Press on the Set button to change the style of the text currently being edited into the font in that elevator level. If there is selected text, only the selected text will change font style, but if there is no selected text then all text will change font style.

Move Button

Use to move the text outline around on the Canvas. It works on the selected characters, and if no characters are selected, it works on all the characters. (If characters are selected, they change color while being moved.)

To move text:

- **Press Move.**
- **Press on the selected text and drag to its new position.**
- **Press Move again to turn it off.**

You cannot select new text while Move is on.

Refresh Text Button

Updates the displayed text. The displayed text automatically updates when most functions are used, but when new text is typed in there can be update problems which will be corrected by pressing this button.

Text Elevator

Under the font elevator are six elevator boxes. Each box in the Text Elevator can hold a page of unrendered text outline. You edit the contents of the active elevator box. Press on a different elevator box to edit a different level.

When the Copy prefix is on, pressing on an elevator level copies the text in the current level to the new one.

Text Size Button

Figure 4-135. Text Size Popup

Use to adjust the size of the text. This button acts on the selected characters of the text, and if no text is selected, it acts on all the characters.

To change text size:

- **Press the Text Size Button.** The Text Size Popup appears.
- **Press and drag the slider to resize the active text.** The displayed text changes size.
- **Press the green OK button on the popup when the text is at the desired size.**

You can select different text with the pen while the Text Size Popup is still up.

Center Text Button

The Center Button centers the bounding box of the text. It centers all the displayed text, regardless of selects.

Leading Button

Figure 4-136. Leading Button

Use to adjust the leading (space between lines) of the text. It works on selected text, or if no text is selected, it works on all the text.

To change the leading:

- **Press the Lead Button.** The Text Leading Popup appears.
- **Press and drag the slider to adjust the leading of the selected text.**
- **Press the green OK button on the popup when the text is at the desired leading.**

Align Text Button

Figure 4-137. Align Popup

Allows left, center, right, and full justification. Affects all the current text, not just the selected text.

To change the justification of the text:

- **Press the Align Text Button.** The Align Popup appears.
- **Press one of the Align Mode Buttons to make it active.** The Align Popup disappears and the text display adjusts according to the chosen mode.

The Align Left Button justifies the text to the left.

The Align Right Button justifies the text to the right.

The Align Center Button centers the text horizontally.

The Align Justify Button justifies the text to left and right, adjusting the kerning line by line.

Kerning Button

Figure 4-138. Kerning Popup

Use to adjust the kerning (space between characters) of the text. This acts on the selected text, and if no text is selected, it acts on the character before the insert point. If you want to change all the text, you must select it.

To kern selected text:

- **Press the Text Kerning Button.** The Text Kerning Popup appears.

- **Press and drag the slider to kern the active text.** The kerning changes on the displayed text. The text can be kerned negatively or positively. To change the kerning back to zero, press Reset. **Press the green OK button on the popup when the text is at the desired kerning.**

You can select different text with the pen or arrow keys while the Kerning Popup is still up.

Erase Text Button

Deletes the selected text, or if there is no selected text, deletes the character just before the insertion point.

Erase All Button

Deletes the entire buffer of text.

Transform Text Button

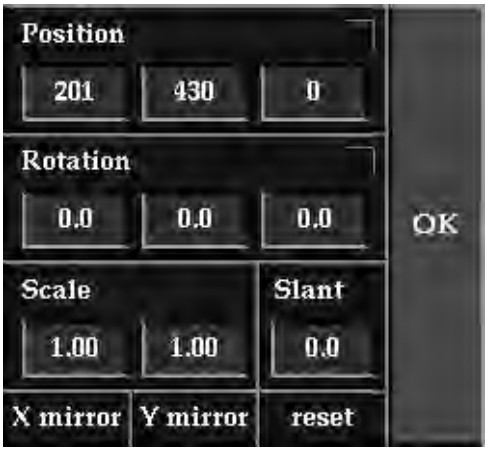

Figure 4-139. Transform Popup

Transform Text provides a popup similar to Paste Distort with functions for positioning, rotating, scaling, slanting, and mirroring the text outline, prior to rendering. Transform works on the entire buffer, the current line, or a single character. You can change modes and the active character or line while the Transform Popup is up. To change modes, press on the text window inside the Transform button until it displays the correct mode: Buffer, Line or Character.

To transform text:

- **Press the Transform Text Button.** The Transform Popup comes up and a wireframe bounding box appears around the displayed text on the Canvas. NOTE: You must type in some text before the Transform Button can be used.

- **Use the functions of the Transform Popup to position, rotate, scale, slant, and mirror the displayed text.** The Text Transform Popup works similar to Paste Distort. When the Transform Popup is up, to change the active character, press the right and left arrow keys. To change the active line, press the up and down arrow keys on the keyboard. To change what mode Transform is in, press on the text window in the Transform Text Button.

- **Press the OK Button.** The Transform Popup disappears.

Render Text Button

Figure 4-140. Render Popup

Press at any time to render text to the Canvas in the current color at the current transparency. It works on selected text, or if no text is selected, it works on all the text. The corner Erase button of the OK button erases the Canvas, Temp, or Mask before rendering. Render Text has a popup that allows you to render into the Mask, Temp Buffer, or Canvas. *You can render the text as solid color, as an outline, or as a mask.*

To choose how to render the text:

- **Press the corner button of the Text Render Button.** The Render Popup appears.

- **Press a Render Mode Button to choose how to render the text.** The Button changes between Canvas, Temp, and Mask Modes, indicating whether Liberty will render the text to the Canvas, to the Temp, or as a Mask on the Canvas.

- **Press either the Filled Button or the Outline Button to choose to render the text in outline or filled (solid) mode.** Outline mode drags the current brush around the vector outline of the text. In outline mode, the current paint mode (Normal, Reveal, etc.) is used, along with any selected Fold, Jitter, and Noise settings. (See "Paint Modes Popup" on page 4-275 for more information about these modes.)

- **Press the OK Button.** The text is rendered according to the current settings. The Erase OK Button erases first, then renders.

An example of an application of outline mode: after rendering your text solid to the Canvas, choose a small light-colored airbrush with the Transparency Slider at a low setting. Then Render in Outline mode with the Under Prefix on. Liberty draws a soft glow around the solid text.

Text Save and Recall

Use these buttons to save and recall text files. All settings and text are saved, including font style. At any time, you can use no more than four font styles in one text file (since there are four levels to the Font Elevator). If you save a text file with four different font styles in it and recall it later, the original four font styles are called into the Font Elevator from the

disk, if they are not already there. If less than four font styles need to be recalled, they are loaded into the Font Elevator starting at the top level. If the Recall Path for the font directory has changed, the stored fonts will not be found, and they will be replaced by the current fonts in the Font Elevator.

4.20.2 International Character Panel

Figure 4-141. International Character Panel

While editing text, press the left end of the light blue Text title bar (at the top of the Text Panel) to call up the International Character Panel.

To use an international character in your text, press on the desired character in the International Panel, just as if you were pressing a key on the keyboard. The indicated character appears in the wireframe text display after the triangular cursor. Press on the right end of the light blue title bar to return to the main Text Panel.

4.20.3 Accent Panel

Figure 4-142. Accent Panel

While editing text, press the right end of the light blue Text title bar (at the top of the Text Panel) to call up the Accent Panel.

To use an accent mark in your text, press on one of the accent marks in the Accent Panel. The indicated accent mark appears in the wireframe text display above the current character (the one followed by the triangular cursor). Press on the left end of the light blue title bar to return to the main Text Panel.

Accent Position Button

Remarkably enough, you use the Accent Position Button to position accents! The button has 8 directional buttons, similar to the Edge Button. Pressing each directional button moves the accent mark one pixel in that direction. The middle button ("A") is a mode button, which, when on, causes the accent mark to move continuously as long as you press down on a directional button.

If you move a character that has an accent mark, the accent mark moves with the character.

4.21 MACRO PANEL MENU

Figure 4-143. Macro Panel

The Macro function allows you to create macros that record your actions on Liberty and play them back. You can use Macro to perform repetitive tasks that would be tedious to do by hand. You can, for example, use Macros to process stills and large amounts of sequentially numbered files or frames. Or you can use macros to remember complex sequences of actions or set-ups.

4.21.1 Recording and Playing Macros

Record Macro Button

NOTES

Use caution when recording macros with toggle (on/off) or cycling buttons. Since the result of pressing such buttons is dependent on the button's current value, macros may work differently if these button values differ (e.g. if the Paint button gets turned on while recording the macro, playing the macro back when the Paint button is already on will turn the Paint button off, since it is an on/off toggle button.)

Macros will not handle double-clicks (as on the Erase Button for a full-screen erase) because Macros do not record time duration and so do not recognize two clicks in quick succession. If you want to erase the whole screen while recording a Macro, press Mask All, then Erase (once).

To record a Macro:

- **Press the Record Macro Button.** The File Popup appears.
- **Type in or press on the name for the recording to be saved under.** The popup disappears. The Record Button is highlighted, indicating that you are recording.
- **Perform the operations that you want to record.** All relevant pen presses and keyboard presses are recorded until you press Stop.
- **Press the Stop Macro Button.** Recording stops.

Play Macro Button

To play a Macro:

- **Press the Play Macro Button.** The File Popup appears showing recorded Macro filenames.

- **Choose a Macro by typing its filename or pressing on its name in the list.** The Macro plays back.

To play a Macro repeatedly:

- **Press the Repeat Prefix Button.**

- **Press the Play Macro Button.** The File Popup appears showing recorded Macro filenames.

- **Choose a Macro by typing its filename or pressing on its name in the list.** You are prompted to enter the number of loops (or times you want the Macro to play).

- **Type the number of times you want the Macro to play.** The Macro plays the appropriate number of times. You can use this technique along with the Increment Buttons in Save and Recall or with the Rotoscope Buttons to recall, process, and save large numbers of sequentially-numbered files.

Pause Macro Button

Press the Pause Button during a Macro recording to suspend recording until you press Pause again. Neither the two presses of Pause or anything between is recorded. While Pause mode is active, the Pause Button is highlighted. This can be useful if you discover during recording that the right menu wasn't installed, etc.

Stop Macro Button

Press to terminate recording. Every Macro must end with Stop.

Delay Macro Button

Press the Delay Button during a Macro recording to insert a pause in the playback. You are prompted to enter a number of seconds for the duration of the pause. This function is often used to slow the pacing of the playback of a Macro when it is being used for display purposes.

Delete Macro Button

Press to bring up the File Popup with the list of Macros on disk. Press on one of the filenames to delete it. You are prompted to confirm the deletion.

Save and Recall State Buttons

Save State helps you set up your menus for playing back a Macro. Often when you play back a Macro you want certain menu set-ups in order that it runs correctly, yet these set-ups are not part of the Macro and can get mistakenly re-set before you play the Macro. A press on Save State saves all the set-ups. Then you press on the Recall State Button as the first step of your Macro, which will automatically restore the proper settings before playing the Macro.

When you press Save State, the usual File Popup appears. Choose a directory and a filename. Then, when creating the Macro, recall the Save State file as the first step of the Macro.

Save State is also useful when working with Macro Actor in the Animation Environment, page 5-151.

4.21.2 Defining Keyboard Keys

Bind Macro Button

Binds a keyboard key to a Macro. The keyboard keys are already bound to many of Liberty's Menu Buttons (see the list below). When you bind a Macro to a key, the previous binding will be replaced by the new binding.

To bind a Macro to a key:

- **Press the Bind Button.** You are prompted to press a keyboard key for the Macro to be bound to.
- **Press a keyboard key.** The File Popup appears, displaying recorded Macro filenames.
- **Press on the file name of the Macro you want to bind.** The File Popup disappears. When you press the keyboard key, the Macro plays back.

Define Key Button

Defines (binds) a keyboard key as a Liberty menu button. The keys are already defined as many of Liberty's menu buttons (see the list below). The previous definition is replaced by the new definition.

To define a key as a Liberty Menu Button:

- **Press the Define Button.** You are prompted to press a keyboard key for a menu button to be defined as.
- **Press a keyboard key.** You are prompted to press a menu button.
- **Press the menu button you want to define to the key.** Now when you press the keyboard key, the defined menu button is activated.

The ESC is permanently defined as CANCEL.

The END key terminates the current operation in progress (e.g. an animation render).

Many keyboard keys are predefined to function buttons. You can undefine them with the Undefine Key or define another function over the function currently defined.

Undefine Button

Press the Undef button to undefine (or unbind) a keyboard key. A keyboard key can be redefined as a new function without being undefined. This button is used if for some reason you do not want a particular key to perform any function. For example, if you press the spacebar often by accident, you wouldn't want that defined as anything.

The pre-defined keys are shown in the table on the following page.

Table 4-5: Pre-Defined Macro Functions

Key	Predefined Function
F1	Magnify in one step
F2	Magnify out one step
F3	Turn Magnify on/off (previous level of magnification)
F4	Turn on Full Page Mode
F5	Turn on/off current grid
F6	Undefined
F7	Undefined
F8	The CANVAS Button (go to full-screen canvas or back)
h	Turn on/off Horizontal Button
v	Turn on/off Vertical Button
i	Turn on/off Invert Prefix Button
c	Turn on/off Copy Prefix Button
a	Turn on/off Add Prefix Button
u	Turn on/off Under Prefix Button
r	Turn on/off Repeat Prefix Button
;	Turn on/off Paint Button
~	Turn on/off Jitter Paint Button
!	Turn on/off Pressure Paint Button
^	Turn on/off Mask in Use Button
l	Press Mask All Button
,	Turn on Paint Mask Button
#	Turn on/off Rectangle Mask Button
t	Press Matte Mask Button
?	Press Help Button

Table 4-5: Pre-Defined Macro Functions

Key	Predefined Function
*****	Turn on/off Multiple Color Mode (on palette)
‘	Press Pick Color Button
Enter	Press Yes Confirmation Button
<	Press Recall Button
>	Press Save Button
{	Temp to Canvas
}	Canvas to Temp
%	Temp/Canvas Swap
/	Turn on/off Autopan
=	Brings up Calculator

4.21.3 Editing Macros (New Format)

With the release of Liberty v5.0 software, the macro file structure and macro editing interface was changed significantly. While Liberty will only record macros using the new format, it can play macros under the new or old format. Due to this capability, the macro editing interface enabled will be dependent on the record macros's file format. To edit new macros follow the procedures below. To edit macros recorded using the old format, following the editing interface described on See "Editing Macros (New Format)" on page 4-421.

Edit Macro Button

Press the Edit Button to edit a recorded Macro. The File Popup appears, displaying the list of filenames of recorded Macros. Press on or type the filename of a Macro to edit it. The entire Canvas area is replaced by a text file of the Macro, putting you into a text editor called Jot.

The Jot Program

Jot is resident on the SGI platform and is called up by Liberty. Jot is a very simple text editor for the purposes of editing line-by-line the text file of the Macro. It works like most text editors with standard commands for cutting, pasting, saving files, etc. Jot has an on-line help feature to answer questions about its operation.

Liberty Help Codes

When the text file of the Macro appears on the Canvas for editing, each line begins at the left with the name, in capitals, of the Liberty menu button invoked at each step of the Macro. These button names are not always easy to interpret. However,

you can use the Liberty Help function to determine the names of buttons. When you press the green Help button, then press on a button you want help on, the help message displayed in the prompt window includes the name of the button (this appears at the end of the message). This can assist in interpreting which button names in the macro pertain to which buttons.

When you have edited the Macro, save it and close the Jot program, which returns you to normal operation of Liberty. You can then run the macro again to test it in its edited form.

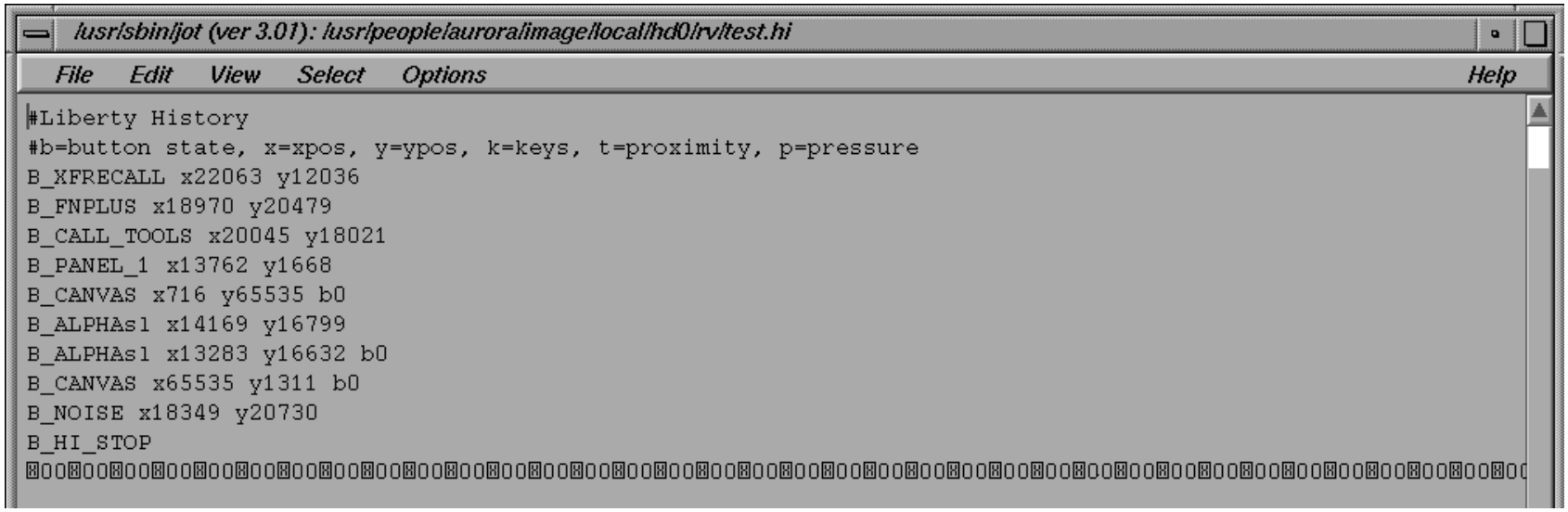

Figure 4-144. "Jot" Macro Editing Utility

4.21.4 Editing Macros (Old Format)

Edit Macro Popup

Use the editing functions to correct small mistakes you make in recording your Macros. The most common mistake is to leave out a step when you record the Macro. The Edit Popup makes it easy to insert steps where you want them. The easiest Macros to edit are those consisting mainly of button presses and keystrokes. Macros with painting tend to get very large and complex and hard to edit. The easiest inserts to make are at the beginning of the Macro (first step) and at the end of the Macro (last step) because you can use the First Step Button or the Last Step Button to get to the insert point.

Current Step Button

This button displays a window that shows the number of the current step of the Macro that you are editing. Press on the window to type in the number of a step to jump to. Whatever button is being pressed in the current step is highlighted on the menu.

First Step (I<) Button

Press to jump back to the first step of the Macro you are editing.

Previous Step (<) Button

Press to go backwards one step the Macro you are editing.

Next Step (>) Button

Press to go to the next step of the Macro you are editing.

Last Step (>I) Button

Press to jump to the last step (Stop Button) of the Macro you are editing.

Insert Step Button

While Insert Mode is on, all button pushes are inserted in sequence before the current step until you press Insert again to turn it off, or press the Accept Button to end the insertion.

To insert steps into the Macro you are editing:

- **Use the Step Buttons to get to the step before which you want to insert.**
- **Press the Insert Step Button to turn Insert Mode on.**
- **Perform the operation (press the menu buttons) you want to insert into the Macro.** The buttons you press are recorded.
- **Press the Insert Button again to turn off Insert Mode.** The button presses that you recorded are inserted into the Macro before the current step. When you play back the Macro, the new button presses will be executed along with the rest of the Macro.

Change Step Button

The Change Step Button turns on/off Change Mode. While Change Mode is on, buttons and keys pressed replace existing steps (starting at the current step number) until you press Change again to turn it off.

To replace steps in a Macro with new steps:

- **Use the Step Buttons to get to the step where you want to start replacing.**

- **Press the Change Step Button to turn Change Mode on.**

- **Press the menu buttons you want to record in place of the existing steps of the Macro.** The buttons you press are recorded.

- **Press the Change Step Button to turn off Change Mode.** The button presses that you recorded replace the steps in the Macro following the current step number displayed when you pressed the Change Button. When you play back the Macro, the new button presses will be executed along with the rest of the Macro.

Delete Step Button

Press to delete the current step.

Delete Rest Button

Press to delete the current step and all steps following it, except for the terminating Stop which can't be deleted or changed.

Step Key Button

Normally the button pressed in a step is highlighted in red, but some buttons, like the Canvas and keyboard keys can't be highlighted. In those cases the step is printed in the Step Key Button.

Cancel Edit Button

Press to discard all changes and terminate editing. The edited Macro is preserved in its original form.

Accept Edit Button

Press to confirm the edited Macro and terminate editing. The edited Macro is saved with its changes.

4.22 VTR PANEL MENU

Figure 4-145. VTR Panel

The VTR Panel is used to control recording devices as both source and target, including VTRs, DDRs, and hard drives.

Source Button

Press to enable the Source, or Play, VTR. When this button is highlighted, all the VTR control buttons apply to the source machine. The corner button of Source calls up the Set-up Popup for the source device. Refer to ***Figure 4-148***, "VTR Set-up Popup" on page 4-432 (and the subsequent sections) for more information about the Source and Target VTRs.

Target Button

Press to enable the Target, or Record, VTR. When this button is highlighted, all the VTR control buttons apply to the record device. The corner button of the Target Button calls up the Target Set-up Popup.

Timecode Windows

These two windows display the current timecode settings for the source and target devices. The timecode windows do not update continuously from the devices, because VTRs have different pre-roll periods which can cause continuous timecode reference to get lost. Each of these "global" timecode windows refer only to the single current (highlighted) device on the Source and Target Set-up Popups, accessed by pressing the Source or Target corner buttons.

To update the timecode of the current device, press the ">" (source) button or the "<" (target) button. The current timecode appears in the corresponding timecode window.

Each timecode window has a set of "Bump" buttons (up and down arrows). Press on these to bump the timecode setting by one frame up or down.

Press directly in a timecode window to enter a new number. Separate the hours, minutes, seconds, and frames with spaces. 1:09:21:15 would be typed 1 9 21 15. Typing just "5" appears as 0:00:00:05.

Timecode Elevator

You can store four timecode positions in the four levels of the elevator.

To set the timecodes in the timecode elevator:

- 1. Press on the elevator level you want to store a timecode setting in.
- 2. Press in a timecode window and enter a new timecode.

- 3. **Press a different elevator level.** When you again press the previous level, the timecode setting will still be there. You can copy a timecode setting from one elevator level to another with the Copy Prefix Button (to do this, press the copy prefix button, then select a new elevator level in the VTR panel. This copies the timecodes in the current level to the new level).

Shuttle and Jog Sliders

Press and drag these sliders to shuttle or jog the enabled (highlighted) source or target device.

Cue Button

Cues the enabled device to the current timecode.

Increment Cue Button (Right Arrow)

Press to increment the timecode by one and cue the current device to that timecode.

Decrement Cue Button (Left Arrow)

Press to decrement the timecode by one and cue the current device to that timecode.

Stop VTR Button

Press to stop the current device. Puts the device in standby mode.

Play VTR Button

Press to play the current recording device.

Grab Button

Press to fetch the currently numbered frame on the source device. Cues the source recording device and grabs the frame (actually one field doubled) and sends it to the buffer (Canvas, Temp or Mask) that's set on the Source Set-up Popup. If set to a disk path it recalls a series of incrementally numbered files. The Grab Popup allows you to choose different modes of grabbing.

Grab Popup

Figure 4-146. Grab Popup Illustration

Press the corner button of the Grab Button to call up the Grab Popup. The Grab Popup has two primary modes: Still Grab and Grab on the Fly. In addition you can choose whether to grab a full frame, or only the even or odd field.

Still Grab

Turn on Still Grab when using recording devices without dynamic tracking.

Grab on the Fly

Grab on the Fly requires a recording device with dynamic tracking. Grab on the Fly is only supported on video boards with built-in VLAN master (Centaur, Video Framer). When Grab on the Fly is enabled, the grab is performed on the currently numbered frame (both fields) while the recording device with dynamic tracking is in motion.

Grab Frame

When on, grabs a full frame with both fields.

Grab Even Field

When on, grabs the even field and doubles it. This, and Grab Odd Field, is useful if you don't want an interlaced image, which may contain undesirable inter-field jitter or movement). It is also useful when the Canvas resolution is different from that of the video source. In such a case, spatial re-scaling is done which can cause undesirable artifacts in an interlaced (2-field) image.

Grab Odd Field

When on, grabs the odd field and doubles it.

Record Button

Press the red Record Button to record to the currently numbered frame to the target device.

Rotoscoping

Liberty's rotoscoping tools allow you to grab frames from one or a number of simultaneous source devices, to modify the frames with Liberty's Paint and Image Tools, and then to record the frames to one or a number of target devices. The possible devices include VTRs, DDRs, disk arrays, and inter-

nal hard drives. You can rout input frames into the Canvas, the current mask, and one or more layers (Temp Buffers).

Liberty provides Source and Target Set-up Menus which allow you to configure your source devices and target (record) devices for rotoscoping. For example, you could composite two video clips from separate VTRs along with a sequence of images from the hard drive. One clip could go to the Canvas, another clip to Layer 1, and the image sequence to Layer 2. Then, each time you press the Roto Button all three sources are updated to their respective buffers. You could then modify and composite the frames using Liberty's many imaging tools before each composited frame is recorded.

Note that Liberty's rotoscoping tools are an enhancement in the Paint Environment of the similar capability in the Animation Environment, where you can configure multiple source devices using Filmstrip Actors (and other types of actors) in the Animation Timeline.

NOTE

The Source and Target Set-up Popups are identical in appearance except that the Source Popup has a large blue button at the top, labeled "Source," and the Target Set-up Popup has a large pink button at the top, labeled "Target." Each popup provides for the configuration of six possible devices (VTRs, DDRs etc.) and six possible disk paths.

VTR Set-up Popup

Figure 4-147. VTR Set-up Popup

Timecode/Frame Number Controls

Each device and disk path has separate controls for setting timecode. You can set up for either timecode or frame mode by toggling the Show Timecode/ Show Frames button in the lower right corner of the VTR Set-Up popup. Each of the six devices has these timecode controls:

- **A Timecode Window for entering time code.**
- **Timecode "Bump" Buttons that allow you to bump the timecode in the window up or down one increment.**
- **A Timecode Input Button (>) that takes the current timecode from the device.**

The six disk paths have the same timecode controls, except for the Timecode Input Button.

Reset All Button

Resets the entire Set-up Popup, including clearing the disk path windows.

Reset Time Button

Resets all timecode windows in the popup to zero.

Reset Src/Tar Button

Resets all of the Source/Target Selection Buttons (the buttons to toggle between "Canvas," "Matte," and "Off") to "Off."

Re-scale Button

When active automatically re-scales the source or target images (see below for details in the Source Set-up Popup and the Target Set-up Popup).

Shrinkwrap

When the Shrinkwrap button is on, files being saved are "shrink-wrapped" to the size of the corresponding image. When shrinkwrap is off, files are always

saved the same size as the canvas, regardless of the size of the image being saved (which may be smaller than the canvas).

The Shrinkwrap button only applies to the Target VTR Set-up menu, when a Disk path is selected as the current output device.

Pre-roll Button

For source and target VLAN-controlled VTRs. The default pre-roll is 5 seconds. On some VTRs you may want to set up a shorter pre-roll, but be careful that you don't create locking problems if you set it too short. If you are experiencing locking problems, you may want to set the pre-roll at longer than 5 seconds. The range is 1 to 10 seconds.

To change the pre-roll:

- 1. **Press on one of the source devices (VTR 1, VTR 2, etc.) to enable it.** The button you press is highlighted.
- 2. **Press the number window in the Pre-roll Button to enter a new pre-roll duration in seconds.** Only the active recording device is changed (it must be a VLAN-controlled VTR).

Dropframe Button

Press the Dropframe Button to turn it on/off. When on, recording/grabbing takes place in Dropframe Mode. The Dropframe Mode affects both the source and target recording device (unlike Pre-roll).

Show Timecode/Show Frames Button

Press this button to change between Timecode Mode and Frame Mode. This affects the display of all numbers in the VTR Panel.

Source (Target) Set-up Popup

Figure 4-148. Source (Target) Set-up Popup

Source Selection Buttons

At the right of each of the twelve timecode windows on the Source Set-up Popup is a Source Selection Button, which you can toggle between Off, Canvas, Temp, and Mask. When the button is Off, that device or disk path is not active. Any of the other three modes causes the device/disk path to be an active source. Choosing Canvas, Temp, or Mask causes the input images to be routed to the corresponding buffer in the Paint Environment during grabs and rotoscoping. Clicking repeatedly on the window cycles through the choices. For a normal Canvas render when only one device is highlighted, you do not need to enable the Source Selection Button. By default the highlighted (current) device is used as the source. When more than one device button has been configured, you can set all the devices to Off and only the current (highlighted) device is used as a source.

When using Temp or Mask as a source mode, use the number window at the right to set which number Temp or Mask to use. That source will then be input to Temp 1, Temp 2, etc. when you press the Grab or Rotoscope Button on the VTR Panel.

To set up a source device:

- 1. **On the VTR Panel press the corner button of the Source Button.** The Source Set-up Popup appears.
- 2. **Press on one of the source devices (VTR 1, VTR 2, etc.) to enable it.** The button you press is highlighted.
- 3. **Choose Off, Canvas, Temp or Mask on the Source Selection Button.** Will default to Canvas if only one device is set up.

- 4. **Enter the source timecode in the timecode window.** This should be the start point of the source sequence.

- 5. **Press OK.** The popup disappears. Grabbing or rotoscoping will now use the indicated device(s) as source.

To set up a source hard disk path:

- 1. **On the VTR Panel press the corner button of the Source Button.** The Source Set-up Popup appears.

- 2. **Press on one of the Disk Buttons (Disk 1, Disk 2, etc. - not the windows) to set it up as a source.** The Disk Button you press becomes highlighted.

- 3. **Press on the window in the highlighted Disk Button.** The File Popup appears.

- 4. **Type in a filename to begin the source path.** There must be a number in the filename. Usually it would be the starting number 0 or 1.

- 5. **Enter the source timecode in the timecode window.** This should be the start point of the source sequence. Use the Timecode/Frame Button at the right to select which mode you want (often you will use frame numbers for a disk path).

- 6. Press OK. The Set-up Popup disappears. Grabbing or rotoscoping will now use the indicated disk path.

Source Re-scale Button

With a device or disk path active, press on the Re-scale Button to enable it (it becomes highlighted), causing the input images to be re-scaled when grabbed or rotoscoped.

The Re-scale Button controls only the current (highlighted) device/disk path. When the Re-scale Button is active, you can use the X and Y windows to enter new resolutions (in pixels) for the images to be re-scaled to.

Layers Auto-compositing

Often, when rotoscoping from multiple VTRs and/or disk paths to the Canvas and Temp buffers, you will use Layers to view and position the images. You can cause layers to be automatically composited (to the Canvas) prior to being recorded during rotoscoping.

The Auto-composite Popup

Figure 4-149. Auto-composite Popup

Press the corner button in the Roto Button to bring up a pop-up with an Auto-composite Layers Button that you can turn on or off.

As an example of this in a rotoscoping project, suppose Temp Layer 1 is on, and you've set up a DDR to input images to the Canvas and a disk path to input images to Layer 1. You've configured the output to record on a VTR. With Auto-composite enabled, you press the First Button to recall the first images to the Canvas and Layer 1 respectively. The two images appear on the Canvas, and you can position Layer 1 using the Layers controls. Pressing on the Roto Button then composites Layer 1 onto the Canvas image, records the result to the VTR, inputs

the next frames to the Canvas and Layer 1, and turns Layers back on. Thus, you can composite layered sequences with one press of the Roto Button per frame.

Target Set-up Popup

NOTE

Refer to Figure 4-149 on page page 4-437 for an illustration of this popup.

The Source and Target Set-up Popups are identical in appearance except that the Source Popup has a large blue button at the top, labeled "Source," and the Target Set-up Popup has a large pink button at the top, labeled "Target." Each popup provides for the configuration of six possible devices (VTRs, DDRs etc.) and six possible disk paths.

Liberty's rotoscoping controls allows you to record to more than one target device at a time, at different resolutions, if desired. You can record either a full-color image or a matte image - a black-and-white rendering of the image's alpha channel.

The only difference between setting up source devices (as outlined above) and setting up target devices is that when setting up a target device, whether it is a VTR or DDR or a disk path, you have only two ways to record - (1) a full-color picture (Canvas Mode) or (2) the matte of the picture (Matte Mode).

Target Selection Buttons

At the right of each of the twelve timecode windows on the Target Set-up Popup is a Target Selection Button, which you can toggle between Off, Canvas, and Matte. When the button is Off, the device or disk path is not active. Either of the other two modes, Canvas or Matte, causes the device/disk path to be an active target.

The number windows at the right of the Target Selection Buttons are disabled, since they are used only for source devices.

For a normal Canvas render when only one device is highlighted, you do not need to enable the Target Selection Button. By default the highlighted (current) device is used as the target, and Canvas Mode is used. When more than one device button has been configured, you can set all the devices to Off and only the current (highlighted) device is used as a target.

To set up a target device:

- 1. **On the VTR Panel press the corner button of the Target Button.** The Target Set-up Popup appears.
- 2. **Press on one of the target devices (VTR 1, VTR 2, etc.) to enable it.** The button you press is highlighted.
- 3. **Choose Off, Canvas, or Matte on the Target Selection Button.** Will default to Canvas if only one device is set up.
- 4. **Enter the target timecode in the timecode window.** This should be the start point of the record sequence.

- 5. **Press OK.** The popup disappears. Recording will now use the indicated device(s) as target.

To set up a target hard disk path:

- 1. **On the VTR Panel press the corner button of the Target Button.** The Target Set-up Popup appears.
- 2. **Press on one of the Disk Buttons (Disk 1, Disk 2, etc. - not the windows) to set it up as a target.** The Disk Button you press becomes highlighted.
- 3. **Press on the window in the highlighted Disk Button.** The File Popup appears.
- 4. **Type in a filename to begin the target path.** There must be a number in the filename. Usually it would be the starting number 0 or 1.
- 5. **Enter the target timecode in the timecode window.** This should be the start point of the record sequence. Use the Timecode/Frame Button at the right to select which mode you want (often you will use frame numbers for a disk path).
- 6. Press OK**. The Set-up Popup disappears. Recording will now use the indicated disk path.**

The Disk Path File Type Buttons

Every target disk path has a File Type Button at the right of its File Window. Press this button to bring up a File Type Popup that allows you to choose from Liberty's wide range of file formats for the images to be saved.

File Type Popup

Figure 4-150. File Type Popup

The File Type Popup allows you to choose from Liberty file formats and External file formats for still images and Clip file formats for animations.

External Image File Formats

The normal still image file formats from the Save As Popup, such as TIFF and Targa.

Liberty Image File Formats

Standard Liberty .im and Liberty Layers file format.

Clip File Formats

Raw YUV for use with the RAID Disk Array (see the Liberty Technical Reference manual) and the Chyron Motion File Format for realtime playback on iNFiNiT.

Saving Output as Layers Files

As an alternative to using Auto-composite to composite Layers and Canvas before recording, you may want to save the rotoscoped frames to a sequence of Layers files on disk. In this case, you would disable Auto-composite, and set up a disk path to which each active Layer (and the Canvas) would be saved in a Layers file, frame-by-frame.

The advantage of this is that later you can recall the sequence of Layers files frame by frame, and you can make further changes to the individual Layers, because they are still separate.

To save rotoscoped output as Layers files:

- 1. Set up a disk path in the Target VTR Set-up Popup.

- 2. **Press the File Type Button at the right of the disk path's File Window**. The File Type Popup appears.
- 3. **Press the Layers Button in the "Liberty File Formats" section of the popup.** The button is highlighted and the Layers File Type is assigned to the disk path.
- 4. Press OK and exit all the popups.
- 5. **Proceed with the rotoscope as usual.** Rendered composited frames are saved to the specified disk path as Layers Files.

Layers Undo in Rotoscoping

Unlike Undo for Temps, which undoes the last change made to the current Temp (which is most likely turned on as a layer), Undo for Layers applies to rotoscoping of layers (see above). Layers Undo is available when it is enabled in the Undo Configuration Panel, and when layers are active and being rotoscoped (for example, if the user has layers 1 and 2 on, and is rotoscoping the layers and the Canvas). In such a case, each time you press the Roto Button on the VTR Panel, the current set of layers is saved to a Layers Undo file prior to being written out to the current target device. After writing to the target device, rotoscoping updates the Canvas and the active layers with the next image from the active source devices. At this point, you can use Layers Undo to restore the previous set of images (in the Canvas and each active layer). You can access Layers Undo through the Undo Browse Popup (press the Browse Undo Button in the Brush Panel), by toggling the popup's colored mode button to Layers Mode, which displays the levels of Layers Undo. Note that Layers Undo does not reset the time-codes in the VTR panel. For example, if you use Layers

Undo to go back two levels, you will need to decrement each active source and target timecode by two. Then, rotoscoping can proceed from that point.

Chyron Motion File Format

With this file format you can render animations to a format that contains all the frames under a single file name. When the render is finished, you can transfer the file to the iNFiNiT for realtime playback. The Animation Environment (Section 5) has the same access to saving in the Chyron Motion File Format.

Note that when saving to a Chyron Motion File, the disk path's frame numbers must always start with zero. For example, when recording to a Chyron Motion Path in the Animation Environment, the "In" frame number/timecode must be zero, or the record will fail. This is because the software uses frame zero to trigger the start of a Chyron Motion File. Once you've created a Chyron Motion File, however, you can record to different frames within it by altering the target disk path's frame number accordingly (for example, for a fix, you could re-render frames 10 - 20 over the original frames 1- -20).

When rendering to a Chyron Motion File is finished, you can transfer the file via FTP to a remote directory on an iNFiNiT! or other system. The File Type Popup contains a Set-up Button which is active only when the Chyron Motion File Type is selected. This button brings up the Chyron Motion File Set-up Popup, which allows you to enter the host and directory path names of the remote system where you want to store the Chyron Motion File.

Chyron Motion File Set-up Popup

Figure 4-151. Chyron Motion File Set-up Popup

The Chyron Motion File Set-up Popup (in the File Type Popup) allows you to enter set-up information to log on to a remote system.

Node

Enter the node name of the remote system (such as "iNFiNiT").

Path

Enter the path of the directory on the remote system you wish to access (such as C/logos/message)

User Name

Enter the user name used to log on to the remote system (such as "guest"). This user name must correspond to a user account on the remote system.

Password

Enter the password used to log on to the remote system. This password must correspond to the password for the user account on the remote system.

Temp Directory

Enter a temporary directory on the local hard drive where temporary files can be stored. Normally this is set to "usr/tmp," but you can specify a different location if space is tight on the "usr" drive. All files browsed or recalled via FTP pass through this temporary directory, so it needs at least a few megabytes of free space.

X,Y Offset Position

The Chyron Motion File Set-up Popup contains text windows for X and Y offset position. Since Chyron Motion Files are usually small cutouts, you can use these windows to specify the position of the cutout. The cutout then will be displayed at this position on the iNFiNiT!

FTP Settings Elevator

Use the six levels of the elevator to save settings for different remote hosts/directories.

FTP/Local

If the FTP Button is on, the file is transferred via FTP to the specified remote host and directory. If the Local Button is also on, the file is saved to the local hard drive as well.

If only the FTP Button is on, the file will be deleted from the local hard disk after the FTP.

As described above, the Chyron Motion File Type must be enabled on the Target VTR Set-up Popup, and the Animation rendering must be complete (or when rotoscoping the "Last" Button must have been pressed). When the FTP transfer is about to occur, the software checks to see if the file already exists in the remote directory. If it does, you are prompted to

confirm that you want to over-write the file. If you answer "Yes", the FTP transfer will commence. When the transfer finished, the message "FTP Transfer Complete" is displayed in the Prompt Window. If the FTP transfer fails, a red error message appears in the Prompt Window (for example, if the user name or password for the remote system is incorrect).

Re-scaling for Realtime Playback

To achieve realtime playback on the iNFiNiT!, Chyron Motion Files must normally limited in size (for example, 224 x 200 pixels). You can do this most easily using the Re-scale Button in the Target VTR Set-up Popup, where you can enter the target X and Y resolution for each disk path. For example, turning on Re-scale and setting the X and Y rescale controls to 224 and 200 would cause each rendered frame to be re-scaled to 224 x 200 before being written to the Chyron Motion File.

Recalling Chyron Motion Files

You can recall Chyron Motion Files using the Recall and File Manager Tools, just like any other image file format. This only recalls the first frame in the clip, however. To recall multiple frames in the clip, you must select the file as a disk path in the Source VTR Set-up Popup. The Grab Button (in Paint) will then grab individual frames from the Chyron Motion File, based on the disk path's source timecode/frame number. Or, the Filmstrip Actor in Animation can be used to input frames from the file (to do this, put the Filmstrip Actor in Source VTR mode, and assign the file as the disk path for Source VTR; see page 5-120 for more details).

Note also that Chyron Motion Files do not currently have browse images, nor are they browsable as film-strips in the Full-Screen File Manager.

RAW YUV Files for Disk Arrays

This format is utilized for rendering animations (or rotoscoping in Paint) to a format that contains all the frames under a single file name (a clip file). This format is normally used to render or rotoscope to a Disk Array such as the Ciprico, MegaDrive, or EuroLogic Disk Array.

Note that when first saving to a RAW YUV clip file, the disk path's frame numbers must always start with zero. For example, when first recording to a RAW YUV clip file in the Animation environment, the "In" frame number/timecode must be zero, or the record will fail. This is because the software uses frame zero to trigger the start of a RAW YUV clip file. Once you've created a RAW YUV clip file, however, you can record to different frames within it by altering the target disk path's frame number accordingly (for example, for a fix, you could re-render frames 10 – 20 over the original frames 1-20).

To render to a RAW YUV clip, the RAW YUV clip file type must be enabled on the Target VTR Set-up Popup. In addition, when setting up the disk path (the file pathname) for the clip, an extension of ".raw" must be added to the filename.

Once you have rendered a RAW YUV clip file, you can recall frames from the clip, by selecting the clip as a disk path in the Source VTR Set-up Popup. The Grab Button (in Paint) will then grab individual frames from the clip file, based on the disk path's source timecode/frame number. Or, the Filmstrip

Actor in Animation can be used to input frames from the clip (to do this, put the Filmstrip Actor in Source VTR mode, and assign the clip as the disk path for Source VTR; see page 5-120 for more details).

In addition, if the RAW YUV clip is rendered to a Disk Array, and if your SGI system has an O2, Octane, or Impact video board, you can play the clip in real-time through the video board. See the section on Showing Video from a Disk Array (see "Show Button" on page 4-155) for details on how to do this.

Note also that for the above real-time playback through the video board to work, the video clip has to be rendered in 601 PAL (720 x 576) or NTSC (720 x 486) resolution. If the canvas resolution does not match one of these, you can use the Target Re-scale Button (described in the section below) to re-scale the clip to the proper resolution as it is rendered.

Target Re-scale Button

With a device or disk path active, press on the Re-scale Button to enable it (it becomes highlighted), causing the rendered images to be re-scaled before being recorded. The X and Y windows specify the resolution of the re-scaled image.

The Re-scale Button controls only the current (highlighted) device/disk path. When the Re-scale Button is active, you can use the X and Y windows to enter new resolutions (in pixels) for the images to be re-scaled to.

Dropframe Button

Press the Dropframe Button to turn it on/off. When on, recording takes place in Dropframe Mode.

Preroll Button

The default preroll is 5 seconds. On some VTRs you may want to set up a shorter preroll, but be careful that you don't create locking problems by giving it too short a setting. If you are experiencing locking problems, you may want to set the preroll at longer than 5 seconds. The range is 1 to 10 seconds.

Rotoscope Button (Roto)

When you have set up the source and target devices, press Roto to record the current Canvas to the target device(s) and fetch the next frame from the source device(s). Use the First Button for the first rotoscope frame - fetch only, no record. Use the Last Button for the last rotoscope frame - record only, no fetch.

4.23 DISK PANEL MENU

Figure 4-152. Disk Panel

Many of the Disk Panel Functions are short cuts to performing functions that are also found on the Full Screen File Menu. The Disk Panel Functions perform their operations on one file at a time, while you can operate on many files at one time in the Full Screen File Menu (see page 4-217). The Popup for controlling the Hewlett Packard VidJet Pro printer is also on the Disk Panel, along with the button for accessing the Artstar optical disk drive.

4.23.1 Delete File Button

To delete a file:

- **Press the Delete File Button**. The File Popup appears.
- **Press on a file name you want to delete.** A confirmation popup appears.
- **Press Yes to confirm the deletion.**

This button may be used with the Repeat prefix to delete multiple files.

4.23.2 Move File Button

To move a file:

- **Press the Move File Button.** The File Popup appears.
- **Press on a file name you want to move.** The File Popup displays all the directories.
- **Press on the target directory.** The file is moved.

4.23.3 Copy File Button

To copy a file:

- **Press the Copy File Button.** The File Popup appears.
- **Press on a file name you want to copy.** The File Popup displays all the directories.
- **Press on the target directory.** The file is copied.

4.23.4 Browse Button

This Button calls up the Temp/Mask Popup, which is usually accessed by pressing the Temp Buffer Window in the Buffers Panel. The Temp/Mask Popup displays browse images of all six Temps and all six mask buffers.

Vidjet Button

This button is used in conjunction with the Hewlett-Packard® Vidjet Pro™ Printer. The Vidjet Pro interface permits printing of the canvas image to a H-P InkJet™ or LaserJet™ printer. For more information about the H-P VidJet Pro, see page 4-456.

Artstar Button Popup

Figure 4-153. Artstar Button

The Artstar Button is a recall button used to recall files from an Artstar graphics system optical disk. The corner button allows you to designate the SCSI port that the optical disk is connected to. With the main part of the Artstar Button, you call up a file recall popup to list files, and you can go into the Full Screen Popup to browse files and recall them. However, no other functions are available, other than browse and recall.

4.24 H-P Vidjet Pro™

The Vidjet Pro is installed in the Configuration Environment of Liberty. One of the video boards must first be installed. If the video board is de-installed, so is the Vidjet.

NOTE

YOU SHOULD RESTART LIBERTY AFTER INSTALLING THE VIDJET!

The Vidjet print manager interface includes three menus. The Main Menu appears when the Vidjet Button in the Disk Panel is pressed. The Vidjet must

first have been installed in the Configuration Environment, otherwise the message "Vidjet not installed" will print to the Prompt Window and the button will not bring up the Vidjet Menu. When the menu first comes up, many parameters of the Vidjet are being queried, so it takes a few seconds. The more frequently changing parameters are placed on the Main Menu. A secondary menu, the Install Menu, can be brought up by clicking on the Install Button in the Main Menu. Fields that are not often changed, such as what printer is hooked up, are placed here. Most fields in the Install Menu should be set once and then left alone. Another secondary menu, the Color Adjust Menu, can be brought up by clicking on the Color Adjust Button in the Main Menu. This menu controls the image color when grabbing frames and printing them.

Hardware

Make sure the RS-232/422 switch on the back of the Vidjet is set to RS-232.

Make sure the cable from the video board to the back of the Vidjet is secure and the cable is connected from serial port #2 of the computer to the Vidjet. Also, connect the cable from the video board to the monitor, so you can see the video input and the cable from the Vidjet (Monitor label in the back of the Vidjet) to the monitor. You'll have to switch to the line on the monitor that is coming from the Vidjet in order to view the frames that have been stored in the Vidjet's memory.

Main Menu

The fields that can be set in the Main Menu include:

- **Resolution ["Res" button]**

- **Fields (1, 2, or both) that will print ["Field" button]**
- **Format of the images (Tile, 1 per page, various Storyboard and Logsheet formats, etc.) ["Format" button]**
- **Placement of the image on the page (center, upper left, etc.) ["Justify" button]**
- **Size of the image ["Size" button],**
- **Source of the timecode that is optionally printed under an image**
- **Vidjet internal, remote, or LTC ["TC Src" button]**
- **Timecode to print under the image ["T-Code" button]**
- **Frame number that is currently being viewed ["Current Frame" button]**
- **Number of copies that will print ["Copies" button]**
- **Image source (Video or Vidjet Frame memory) ["Image Source" button]**

When the image source is set to "Memory", the specified images to be printed will come from the Vidjet's internal Frame Memory. "Grabbing" an image places it memory. When the image source is set to "Video", the image to print will come from the video being sent in and not what has been stored in memory.

Clicking on the inset buttons for the above will cycle through the possible values for each parameter. Some parameters are dependent on others. For example, the user can not change the "Justify" parameter if the "Format" has not been set to "1 per page".

Also, the "Size" parameter depends upon whether the user is using the English or Metric system, what printer is being used, and what type of paper is being used.

“T-Code" can only be set when "TC Src" has been set to "REMOTE". The timecode only applies to the next frame that is grabbed. When any field can not be changed a row of asterisk will appear to signal the user.

The five toggle buttons: “Color Out”, “Color In”, "Time/Date", "Page Num", and “TimeCode” appear at the bottom of the Menu. Clicking on them will turn these parameters on (button is lit) and off (button is not lit). "Color Out", if lit, means that you are printing in color. "Color In", if lit, means that you are grabbing images into the Vidjet in color. "Time/Date", if lit, means that the time and date will be printed on each page. “Page Num”, if lit, means that pages will be numbered. In order to turn on “Color Out”, “Color In” must be on, since it doesn't make sense to print an image in color that was input in black and white.

The three buttons "Current Frame", "Frames Grabbed", and "Frames Free" show the current state of the Vidjet's Frame Memory. The Frame Memory is the storage area for images that have been grabbed into the Vidjet.

“Frames Grabbed” shows you how many frames have been stored in memory. This button can't be set by the user. “Frames Free” shows how many frames are left in memory. This button also is not adjustable by the user.

"Current Frame" shows the number of the frame being viewed on the monitor. The arrow buttons can be used to view the next/previous frame in memory or a number can be typed in and the image with that frame number will be shown on the monitor. If the image source is set to "Video" instead of "Memory", there will be no current frame and a row of asterisk will appear in "Current Frame". Various factors can affect the state of memory. The buttons "Grab 1", "Clear", and "Clear All" affect memory and will be described shortly.

Changing the resolution ("Res") or turning color grabbing on/off ("Color In") will affect the number of frames that can be stored. For example, in high resolution color grabbing, 7 images can be stored, but in low resolution color grabbing, 123 images can be stored. If either of these fields is reset, frame memory will be cleared. All frames that were stored will be lost in anticipation of starting over with different image quality.

Various "command buttons" appear along the right side of the Main Menu. If the "Print" button is pressed, 1 image will print (either from memory or video depending on the image source setting). If the "Print Seq" button is pressed, a sequence of images will be printed as the user has specified. In order to print a sequence of images, the image source must be set to "Memory" and there should be some frames that have been "grabbed" and stored in memory previously. If "Grab 1" is pressed, the image that is on the canvas will be input to the Vidjet's memory (via the video board). If "Clear All" is pressed, all frames in memory will be removed. If "Clear" is pressed, the current frame will be cleared from memory and the remaining frames will be renum-

bered. The affects of "Grab 1", "Clear All", and "Clear" will be seen in the "Current Frame", "Frames Grabbed", and "Frames Free" fields.

If "Tag" is pressed, the current frame will be tagged. A tagged frame will get printed when one of the print buttons is pressed. By default, if no frames are tagged, they will all get printed. Tagging allows for editing. If the user decides not to print all frames in memory, he/she just tags the ones that need to be printed. The order that frames are tagged in determines the order they will print in. If "Untag" is pressed, the current frame will be untagged (won't be printed). If "Stop" is pressed, printing will be cancelled. If "Save" is pressed, the current configuration for the Vidjet will be saved and can be recalled any time later by pressing the "Recall" button. If "Status" is pressed, the current state, such as "READY", "PRINTING CANCELLED", "WAITING FOR PRINTER", etc., of the Vidjet will be printed to the message area of Liberty.

Printing does take some time and you need to wait until the state of the Vidjet is "PRINT COMPLETED" before trying to continue.

The EXIT button at the bottom of the Main Menu simply pops down the Menu. The current configuration is remembered.

Color Adjust Menu

The secondary Menus are less frequently used that the Main Menu. Pressing "Color Adjust" brings up a Menu with seven sliders: one each for adjusting image brightness, contrast, hue, saturation, red gain, green gain, and blue gain. The defaults are 0 degrees for hue rotation, 100% for contrast, brightness, and saturation, and 0 for the rgb gains.

Hue, saturation, brightness, and contrast apply more to an image that is coming in Composite form. The gains apply more to an image that is coming in RGB form. The color adjustments apply only to images before they are grabbed. No adjustments can be made after grabbing. The OK button sets the color adjustments the user has made. The EXIT button removes the Menu.

Install Menu

Pressing the "Install" button in the Main Menu brings up another secondary Menu.

The fields in this Menu include:

- **the type of paper to use (this affects how much ink will be put down) ["Paper Type"]**
- **The header type that will print on each page (This can be turned off, or the Standard two lines can be printed, or the user can customize the header ["Header"])**
- **The first line of the custom header ["Line 1"]**
- **The second line of the custom header [Line 2]**
- **The print quality ["Print Mode"],**
- **The printer type ["Printer"],**
- **The video format input (RGB, Composite, etc.) ["Video"],**
- **The units being used (English or Metric) ["Units"]**
- **The video standard (NTSC, PAL, SECAM, or AUTO (the machine figures it out))**
- **Auto can not detect Secam-it will assume 625 lines is PAL ["Lines"]**
- **The paper size ["Paper Size"]**

- **The date ["Month", "Day", "Year"]**
- **The time ["Time"].**

Time is military time. Hitting the "Set" button will set the Vidjet's clock to whatever was typed into the three buttons after the Time label which represent hour, minutes, and seconds. If nothing is entered, the current time on the Vidjet will flash in the three buttons.

The three toggle buttons on the right side of the Menu are: "Freeze", "Under", and "Ext Sync". These can be turned on and off. "Freeze", if lit, means that a freeze frame will take place when grabbing. "Under", if lit, means that print underscan is on.

"Ext Sync", if lit, means that the user is using an external as opposed to internal sync.

The EXIT button removes the Menu. Again, some fields are dependent on others. If a field can not be set, asterisk will appear in that button and a message will print in Liberty's message area if the user clicks on the asterisk.

The "Show" button in Liberty's full screen browser Menu will place as much of the browser full screen as will fit (starting at the lower left corner) into the canvas and on the monitor (via the video board). This image can then be printed. In order to print the full screen browser, the canvas size must be set to the full screen size in the configuration environment of Liberty.

Example: Printing

In order to print the image in the canvas---

- **Set the Size as you like.**

- **Set the Format to "1 per page".**
- **Set Justify as desired (center, upper right, etc.).**
- **Set the image source to "Video".**
- **Press the "Print 1" button.**

In order to save an image (in the canvas) into the Vidjet's memory---

- **Press the "Grab 1" button.**

In order to print a sequence of images---

- **Grab the images from the canvas into memory using the "Grab 1" button.**
- **View the images using the "Current Frame" button (make sure the monitor is set to the line that is coming from the Vidjet and not the video board.)**
- **Tag/Untag frames if you don't want to print them all.**

  If a frame has been tagged the "Current Frame" label will light up when that frame is viewed.

  "Current Frame" should be lit if there are no frames (current frame = 0)
- **Set the image source to "Memory".**
- **Press the "Print Seq" button.**

Problems

If the custom header is not being set---

- **Make sure the "Header" field is set to "Custom".**

- **The characters that you type in must be enclosed in double quotes.**
- **Line 1 can be up to 70 characters and Line 2 up to 20 characters (not including quotes)**

If the monitor only displays a color video input in monochrome---

- **Make sure the monitor is not a monochrome-only monitor.**

NOTE

If using Secam (and Composite input), the monitor will display the color image in monochrome, but print it in color.

If the image size won't change---

- **Make sure one of the predefined layouts (Storyboards and Logsheets) isn't chosen.**

If the print-out should be multi-column, but is only a single column---

- **Only the laser jet printers, the Deskjet 1200C, the PaintJet XL300, and the DesignJet 650C support multi-column printing.**

If there is a long delay between copies---

- **If the printer you are using doesn't support multiple copy printing, the Vidjet must reprocess and send the image data for each copy.**

If black bars appear at edges of the printed images---

- **Turn the "Under" toggle button in the Install Menu off.**

If the edges look uneven or there are bands throughout the image---

- **Check the setting of the "Printer Mode" button. Banding may occur if it's set to "Fast".**
- **Also check the resolution ("Res") and print fields ("Fields").**

If the monitor display is not what you expected---

- **Make sure the Image Source is "Video" if you want to see the video in.**
- **Make sure the video standard ("Video" button) is set properly in the Install Menu.**
- **Make sure the Image Source is "Memory" if you want to see what is in frame memory, and that the monitor is set to the line that is coming from the Vidjet, not the video board.**

If you are losing frames from memory or you can't print or grab---

- **Make sure memory is not full (Free Frames = 0).**

  Even if you have the image source set to "Video", if you press the "Print 1" key, and there are no free frames, you can not print. This is because the Vidjet will do a temporary grab for you (it won't be reflected in the Menu) until the image data has been sent to the printer.
- **Make sure you have not changed Video standards and have the Line field set to "Auto".**
- **When the video input signal changes, memory will be cleared.**
- **Make sure you have not changes resolution or the "Color In" toggle button unless you don't need what is in memory, since doing so will clear frame memory.**

Warnings

If the buttons on the Vidjet have been manually adjusted while you are running the Vidjet software, the Menu you are seeing may not reflect the actual state of the print manager. Subsequent commands may not execute properly. You should restart the paint environment, so the Menu on screen will reflect the actual state of the Vidjet. Again, buttons should not be manually pressed on the Vidjet.

If you are using a tablet through serial port #1 and a VTR (or VLAN) through serial port #2, the Vidjet will take over the port being used by the VTR and communication with the VTR will be lost. In order to restore communication with the VTR after using the Vidjet, you should de-install the Vidjet in the configuration environment and then re-enter Liberty.

4.25 MORPH FEATURES

Liberty provides two complementary morph programs: Triangle Morph and Line Morph. Line Morph is quite easy to use and gives the best results, but takes more time to render than Triangle Morph. In Line Morph you freely position and modify line segments in a gridless system to create distortions. Line Morph yields extremely organic and smooth results and is usually well worth the extra rendering time.

Triangle Morph is more complicated to use, but renders more quickly. In Triangle Morph you set and move control points, creating a triangular grid to make distortions.

4.25.1 General Procedure for Line Morph & Triangle Morph

You start a morph by setting up the control points (Triangle Morph) or the line segments (Line Morph) that define the beginning, or source, image of the morph. Then you move or modify the source points or lines to create a distortion for the final, or target, image of the morph. You can use morph keyframes to create interim distortions between the source and the final distortion. Morphs render from the Temp Buffer to the Canvas. Always cut your source image into the Temp Buffer before starting the morph.

4.25.2 Line Morph

Figure 4-154. Line Morph Popup

After this step-by-step Line Morph procedure is a button-by-button description of the Line Morph Popup (Figure 4-155).

To create a morph distortion of an image with Line Morph:

[ ] 1. **Cut the image you want to morph into the Temp Buffer.**

[ ] 2. **Press the Line Morph Button in the Image Tools 2 Panel.** The Line Morph Popup appears. If an existing morph appears on the Canvas, click the Reset Button to reset the morph.

[ ] 3. **Press the Add Button on the Line Morph Popup to add line segments on the Canvas to define the beginning of the morph.** Press once to start a line segment; press a second time to define the end of the line segment.

[ ] 4. **Press the Lock Button on the Line Morph Popup.** This locks down the line segments you have added, defining the first morph keyframe. The pointer on the Morph Slider jumps to the right end of the slider.

[ ] 5. **Press the Move Button on the Line Morph Popup and press and drag the line segments on the Canvas, moving, rotating, and scaling them to define the final (target) distortion. To move the line segment, press directly on a line segment and drag it. To rotate and scale the line segment, press just beyond either end and drag.** This sets the line segments defining the final keyframe of the morph.

In general, slight movements of the line segments between keyframes cause subtle effects while larger modifications of the line segments cause wildly warped and twisted

distortions. In particular, if any line segments flip over or intersect in the interim or final keyframes, the distorted picture will fold over on itself and may even contain multiple distorted copies of the source image. Start with small conservative adjustments and work your way up to more flamboyant effects.

[ ] 6. **Press the main part of the OK Button to start the morph.** After a pause, the final distortion of the Temp Buffer image is rendered on top of the existing Canvas image. The corner button performs a faster, lower-resolution render. The Erase Button erases the Canvas before the morph is rendered. The corner of the Erase button performs a faster, lower-resolution erase-render.

Line Morph Add Button

Press to add line segments. Press on the Canvas once to place the beginning of a line segment, then lift and press a second time to place the end of the line segment. Add as many line segments as you want. The "arrowhead" at the front end of the line segment helps you keep track of the orientation of the line segment.

While adding line segments you can use the Move Button (see below) to reposition line segments you have just added. Unlike Triangle Morph, you can add or delete line segments after you press the Lock Button. Press the Add Button a second time or press another Line Morph button to terminate the Add function.

Line Morph Delete Button

Press to delete line segments from the Canvas. On the Canvas press on a line segment to delete it. The line segment disappears. Delete as many segments

as you want before terminating the function by pressing a second time on the Delete Button or any other Line Morph Popup button.

Line Morph Move Button

Press to move line segments. On the Canvas, press in the middle of a line segment to drag it to a new position, or press just beyond an endpoint to drag just the endpoint (stretching or rotating the line segment). You can move line segments in any keyframe at any time, even after pressing the Lock Button. Press the Move Button a second time or any other Line Morph Popup button to terminate the move function.

Line Morph Color Button

Press to switch the color of the line segments. Use this when it's difficult to see the line segments on the Canvas background. The default is red for the line segments which become yellow when they are selected. Press the Color Button to reverse this.

Line Morph Tune Button

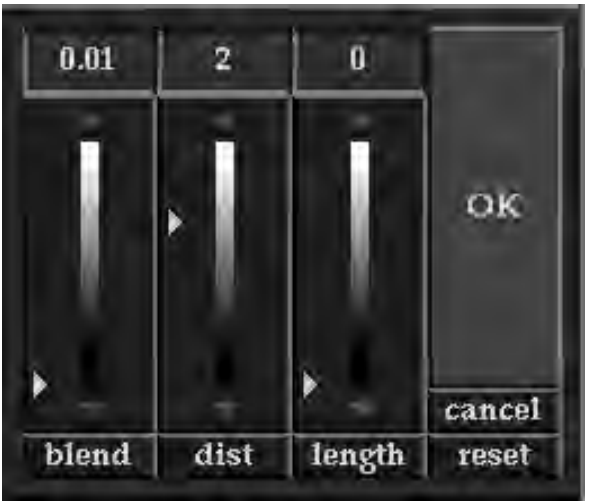

Figure 4-155. Line Morph Tune Popup

Press to call up the Tune Popup. In general, the further away a line segment is from a pixel, the less effect it has on that pixel. Tune allows you to adjust three slider settings: Blend, Distance, and Length. The best way to understand these settings is to experiment (It's sometimes difficult to predict what the exact effect will be for a combination of settings).

Blend Slider

The Blend Slider controls the smoothness of the morph, or the amount of blending between line segments.

Distance Slider

The Distance Slider controls how the effect of a line segment diminishes with distance.

Length Slider

The Length Slider, if non-zero, makes longer line segments have a greater effect on the morph.

Press the Cancel Button on the Tune Popup to cancel any changes you've made to the Tune settings. Press the Reset Button to reset the Tune settings to their defaults.

Line Morph Select Button

Press to select line segments. Press near a line segment to select it. The selected line segments change color. Pressing a selected segment un-selects it. Press the Move Button to move all the selected segments simultaneously. Press the Delete Button to delete all the selected segments simultaneously.

Line Morph Keyframe Timeline Slider

This slider displays a timeline of the morph from beginning to end. You can have many different keyframes on the timeline, though when the morph is rendered, only the information in the two neighboring keyframes to the pointer will be considered. Keyframes in a morph are mostly used in Liberty's animation option; they are not used often when morphing a still image. One good way to use keyframing in a still image is when the final morph is a bit too extreme. A quick way to render the morph in a less extreme version is to add a keyframe near the end of the keyframe timeline and to render the morph at that point.

You can move any keyframe in the slider by pressing on the keyframe marker and dragging it to a new position. No keyframes appear in the slider until

you press the Lock Button. When you press on the slider, the percent completion of the morph at that point is displayed in the Prompt Window.

Line Morph Add Keyframe Button

Press to add a keyframe into the keyframe slider. A keyframe marker appears in the Morph Slider wherever the pointer is when you press Add Keyframe. Use the Move Button to move line segments on the Canvas to define the new keyframe. You can move line segments in any keyframe of the morph at any time.

The number of keyframes you can have is limited by the space along the slider. If you try to add a keyframe too close to an existing keyframe, you are prompted: "Cannot be too close to another keyframe."

Line Morph Copy Keyframe Button

To copy the line segment data from one keyframe to another:

- **Position the pointer in the Keyframe Slider beneath the keyframe you want to copy from.**
- **Press the Copy Button.** You are prompted: **"Please specify keyframe to copy to."**
- **If the pointer is not beneath a keyframe, you are prompted: "Please specify keyframe to copy from." Move the pointer under an existing keyframe marker and press the Copy Button again.**
- **Press below another keyframe marker on the Keyframe Slider.** The data from the first keyframe is copied into the indicated keyframe.

NOTE

Do not press directly on the keyframe marker itself, but under it on the same line as the pointer. A successful copy prompts: "Keyframe copied successfully." If you press directly on a keyframe marker, you are prompted:

"Cannot copy to source keyframe."

Line Morph Delete Keyframe Button

To delete a keyframe:

- In the slider, position the pointer beneath the keyframe marker you want to delete.
- **Press to delete the keyframe at the current position of the pointer on the Keyframe Slider.** The keyframe marker disappears from the slider.

Line Morph Reset Button

Press to delete all line segments and reset the morph. All keyframes are deleted. You are prompted: "Restarted LMORPH. Please enter line segments."

Line Morph Lock Button

Initially the morph is unlocked, meaning that you are editing the first keyframe and no other keyframes exist. Once the first keyframe is complete, pressing Lock creates the corresponding end keyframe, which you then edit to define the distortion.

After pressing Lock you can still add, delete, or move line segments. You only have to press Lock once - when you've set the first keyframe points.

Line Morph Test Button

Position the slider pointer under the morph key-frame whose distortions you want to check. Press the Line Morph Test button to go into Test Mode. When you press on the Canvas, the pixel you press jumps to its original (source) position and shows as a dot in the alternate color. The distance of the displayed dot from the pressed pixel shows you the magnitude and direction of the distortion of that pixel. Press Done or another Line Morph button to terminate Test Mode.

Line Morph Recall and Save buttons

The Line Morph Recall button recalls a previously saved Line Morph from disk. Pressing on it brings up the file recall menu, allowing the user to browse directories and select a file to recall.

The Line Morph Save button saves the currently defined morph in a morph file. Pressing on it brings up the file save menu, allowing the user to browse directories and select a file name to save to. The Save button is grayed out when there is no morph defined yet (before morph lines have been added or before the Lock button has been pressed).

Line Morph Cancel Button

The Cancel button exits the popup without performing a morph.

Line Morph OK Button

Press to render the morphed distortion, as determined by the position of the pointer in the Line Morph Slider. Renders on top of the existing picture on the Canvas, or under it if the Under Prefix is on. The corner button renders at one-fourth resolution.

Line Morph Erase Button

Press the Line Morph Erase Button to erase the Canvas before rendering. The corner button renders at one-fourth resolution.

4.25.3 Triangle Morph

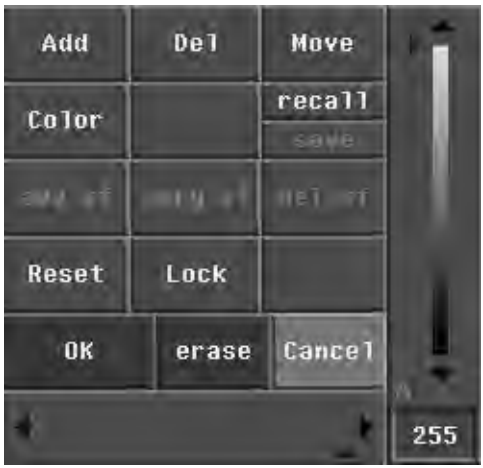

Figure 4-156. Triangle Morph Popup

The discussion of Triangle Morph begins with a step-by-step description of how to create a morph distortion of an image, followed by a button-by-button description of the Triangle Morph Popup.

To morph a distortion of an image with Triangle Morph:

[ ] 1. **Cut the image to be distorted into the Temp Buffer.**

[ ] 2. **Press the Triangle Morph Button in the Tools 2 Panel.** The Triangle Morph Popup appears. If an existing morph appears on the Canvas, press the Reset Button to reset the morph. The Prompt Window at the bottom of

the Canvas displays the message: "Press twice on canvas to specify 2 bounding box corners."

[ ] 3. **Define a bounding box around the area you want to morph.** Press down and let up quickly to set the first corner of the bounding box, then drag and press again to set the diagonally opposite corner. The bounding box should cover the area you want to distort.

[ ] 4. **Press the Add Button on the Triangle Morph Popup to add control points on the Canvas to define the beginning of the morph.** Generally, add points at the places that you want to distort.

[ ] 5. **Press the Lock Button on the Triangle Morph Popup when you've finished adding points.** This locks down the points, defining the morph source. The pointer jumps to the right end of the Triangle Morph Slider.

[ ] 6. **Press the Move Button on the Triangle Morph Popup and press and drag the control points on the Canvas, moving them to define the final distortion.** This sets the points defining the target of the morph. The morph distortion happens between the source position of the points and the target position of the points.

[ ] 7. **Press the OK Button to start the morph.** After a pause for rendering, the final distortion of the image in the Temp Buffer is displayed on top of the existing Canvas image. The Erase OK Button erases the existing Canvas before the morph is rendered.

Triangle Morph Add Points Button

Press to add control points to the Canvas. (You must specify a bounding box first. Press down and let up quickly to set the first corner of the bounding

box, then drag and press again to set the diagonally opposite corner.) Adding a point connects the new point to other points (or to corners of the bounding box), forming triangular segments, creating a grid that controls the morph. You can use the Move Button while adding points to reposition points you have just added. Unlike Line Morph, you cannot add or delete points after you press the Lock Button. Press Done or another Triangle Morph Popup Button to terminate the Add function.

Triangle Morph Delete Points Button

Press to delete control points from the Canvas. On the Canvas press on a point to delete it. The point disappears along with the lines connecting it to other points. Press the Delete Button a second time or another Triangle Morph Popup button to terminate the delete function.

Triangle Morph Move Points Button

Press to move control points on the Canvas. On the Canvas press on and drag a point. The point moves, along with the lines connecting it to other points. You are prevented from moving a point across a connecting line. You can move points in any keyframe of the morph at any time, even after pressing the Lock Button. Press the Move Button a second time or another Triangle Morph Popup button to terminate the Move function.

Triangle Morph Add Keyframe Button

You use morph keyframes mostly in animations, but they can be useful in still morphs as well to create interim distortions between the source and the final distortion.

To add a keyframe to the Keyframe Slider:

- **Move the pointer to the place on the slider where you want to add a keyframe.**

- **Press the Add Keyframe Button.** A keyframe marker appears in the Keyframe Slider above the pointer. After adding a keyframe, use the Move Button to move points on the Canvas to define it. You can move points in any keyframe of the morph at any time.

The number of keyframes you can have is limited by the space along the slider. If you try to add a keyframe too close to an existing keyframe, you are prompted: "Cannot be too close to another keyframe." Move the pointer and try again.

Triangle Morph Copy Keyframe Button

To copy the control points from one keyframe to another:

- **In the slider, position the pointer beneath the keyframe marker you want to copy from.**

- **Press the Copy Button**. You are prompted: **"Please specify keyframe to copy to."** If the pointer is not beneath a keyframe marker, you are prompted: **"Please specify keyframe to copy from."** In this case, move the pointer under an existing keyframe marker and press the Copy Button again.

- **Press below another keyframe marker on the Keyframe Slider.** The data from the first keyframe is copied into the indicated keyframe.

NOTE

Do not press directly on the keyframe marker itself, but under it on the same level as the pointer. A successful copy prompts: "Keyframe copied successfully." If you try to press directly on a keyframe marker, you are prompted: "Cannot copy to source keyframe."

Triangle Morph Delete Keyframe Button

To delete a keyframe:

- **Position the pointer beneath the keyframe marker you want to delete.**
- **Press the Delete Keyframe Button.** The keyframe marker disappears from the slider.

Rendering a Morph Keyframe

After creating a keyframe, you can render it by pressing the OK Button when the pointer is under the keyframe you want to render. If you want to render at a place between keyframes, you need only place the pointer there instead. Rendering takes place wherever the pointer is positioned, regardless of whether it's right under a keyframe or not.

Triangle Morph Reset Button

Press to reset the morph functions. All keyframes, including points, connecting lines, and the bounding box are deleted. You are prompted:

"Restarted MORPH. Please specify bounding box."

Triangle Morph Lock Button

Initially the morph is unlocked, meaning that you are editing the first keyframe, and no other keyframes exist. Once the first keyframe is complete, pressing lock creates the corresponding end keyframe, which you then edit to define the distortion.

Press to lock control points after the first keyframe is set. The beginning and ending keyframe markers appear on the Keyframe Slider, with the pointer at the last keyframe. Now you can use the Move Button to modify the points on the Canvas to define the final keyframe. You can also add more keyframes. After pressing Lock you can't add or delete points, only move them. You only have to press Lock once - after you've finished setting the first keyframe points.

Triangle Morph Recall and Save buttons

The Triangle Morph Recall button recalls a previously saved Triangle Morph from disk. Pressing on it brings up the file recall menu, allowing the user to browse directories and select a file to recall.

The Triangle Morph Save button saves the currently defined morph in a morph file. Pressing on it brings up the file save menu, allowing the user to browse directories and select a file name to save to. The Save button is grayed out when there is no morph defined yet (before morph lines have been added or before the Lock button has been pressed).

Triangle Morph Cancel Button

The Cancel button exits the popup without performing a morph.

Triangle Morph OK Button

Press to render the morph, as determined by the position of the pointer in the Keyframe Slider. Renders on top of the existing picture on the Canvas, or under it, if the Under Prefix is on.

Press the OK Button. The existing Canvas image is erased before the final distortion of the Temp image is displayed on the Canvas.

4.26 Importing Jaleo Clips

Liberty provides the ability to import Jaleo clips in the Paint Environment so that Liberty's comprehensive paint tools can apply various treatments to the Jaleo images. Liberty gives you the ability to access the source material pointed to by the Jaleo **.nclp** files.

Jaleo Environment Variable

In order for Liberty to recognize the Jaleo clip files and import the high resolution files from the Jaleo directory, it is necessary to configure the environment variable in the **liberty** account to recognize the location of the Jaleo files automatically.

To set the Environment Variable in the Liberty account:

- **1. Login to liberty account.**
- **2. Open UNIX shell window.**
- **3. Set directory to /usr/people/liberty if not set already.**

- **4. Type the following shell command:**

  ls -a

  Verify that there is a file called: **.cshrc**

- **5. Open the file .cshrc for editing by typing:**

  jot .cshrc

- **6. Set the cursor at the end of the file.**
- **7. Type the following line in the shell window.**

  seten JALEO_WORK /usr/people/jaleo/WORK

- **8. Press the Enter key on the keyboard.**
- **9. Save the file.**
- **10. Close the jot file window.**

Reading Jaleo Clip Files

Once Liberty has been configured to recognize the Jaleo file location, the artist uses the VTR setup panel to define the disk path to the Jaleo clips and then import them to apply a rotoscoping treatment.

To read the Jaleo clips:

- **1. Press the Source comer popup button.**
- 2. **If the message:**

  "VTR's have not been configured.
  Do it now?"

  appears, press the "Yes" button. Press the Source corner popup button again.
- **3. Press in the desired Disk file Window. The Recall File popup appears.**
- **4. Select the Directory path to the Jaleo .nclp**

  (e.g.:/usr/people/jaleo/WORK)
- **5. Choose the Jaleo .nclp to be recalled.**
- **6. Press the OK button.**
- **7. Continue with normal rotoscoping procedures.**

5 - Animation Environment

5.1 Animation Environment Introduction

Liberty's Animation Environment (***Figure 5-1***) is a separate full-screen menu that you enter by pressing the "A" Button in the Environment Buttons (PACL) in the lower left corner of the Paint Environment and the Configure Environment. You can also press the Animation Button in the Login Environment.

All of Liberty's animation is created in the Animation Environment using elements created in Paint or imported from another source, such as a VTR or a 3D software package.

The Animation Environment has four main parts:

Animation Playback Menu: The Animation Playback Menu controls playback/recording of an animation.

Animation Timeline: The Animation Timeline contains the actors, or basic elements of the animation. Actors are represented on the Timeline by color-coded horizontal bars. There are several different types of actors, each with a different function or effect. An actor's type is indicated by the color of the bar that represents it.

Actor Edit Menu: The Actor Edit Menu appears at the left of the Timeline, and allows you to create, position and time individual actors in the Timeline.

Actor Popup: The Actor Popup appears at the right of the Timeline, and contains the data and specialized functions of the actor selected on the Timeline.

When you select each type of actor, its Actor Popup appears at the right. For the most part, the menus of the Animation Environment remain constant. However, the Actor Popup displays different popup menus for each type of animation Actor.

The Animation Environment contains some familiar functions from the Paint Environment: the Prompt Window, Magnify Buttons, Undo, Erase, Erase All, Grid, Direction buttons, and the Prefix Buttons.

5.1.1 Number Windows in the Animation Environment

Many windows in the Animation Environment display numbers. You can input to them directly by pressing on the window and typing a number, followed by the Enter key.

You can add to a number by typing "p" followed by the amount you want to add. You can subtract from a number by typing "m" followed by the amount you want to subtract.

Pressing in the upper half of the label of a button adds one to the number, pressing in the lower half subtracts one.

Windows indicating duration or times can use either timecode or frame numbers.

Figure 5-1. Animation Environment

5.1.2 Creating Curve Paths and Keyframes

In addition to the menus displayed when you first come into the Animation Environment, there are several popups that you often use to provide animation actors with curve paths and keyframes. The popup for creating curve paths is identical to the Curve Popup in the Paint Environment. The Keyframe Timeline appears over the main Animation Timeline and provides a timeline for each individual actor. When you edit a keyframe, the Keyframe Distort Popup appears, which is almost identical to the Paste Distort popup in the Paint environment.

5.2 ANIMATION TIMELINE

The Animation Timeline (Figure 5-2) is the large horizontal window below the Canvas that displays the entire current animation with layers containing color-coded bars representing animation "actors."

What is an animation layer?

An animation layer on the Timeline is like a clear acetate cel in conventional cel animation. On the Timeline the highest layer appears on top in the animation, the lowest layer on the bottom. You can use an unlimited number of layers both above and below the Zero layer. One layer can hold any number of actors and any combination of actor types.

What is an animation actor?

Animation actors carry the information about what happens in an animation. An actor is represented on the Timeline by a color-coded bar. Each actor can have its own curve path along which it moves during the animation. Each actor can have a series of key-

frames for DVE-type perspective transformations, size changes, and many other modifications. A single animation can contain many different types of actors, each with a different function or effect. Actors can be any length and several actors can exist in sequence on a single layer.

Layer Number Buttons

The stack of small, square buttons running vertically along the left side of the Timeline are the Layer Number Buttons. Layers above the Zero layer have positive numbers, those below have negative numbers.

When a layer is empty (has no actor in it), and all layers above it are empty, its Layer Number Button is blank. When an actor is added to an empty layer, that layer is numbered according to its distance from the Zero layer.

This is also true (in reverse) of the negative layer numbers below the Zero layer. For example if layer -1 is empty of actors, it will be numbered if layer -2 just below it contains an actor.

The Zero layer

The Zero layer is the base layer of any animation, represented by a thin purple line in the Timeline. No actors can be assigned to this layer, and it cannot be edited. You can create any number of layers above the Zero layer (numbered with positive numbers) and any number of layers below it (numbered with negative numbers). More detailed editing functions using the Layer Number Buttons are discussed in the section on the Actor Edit Menu, page 5-44.

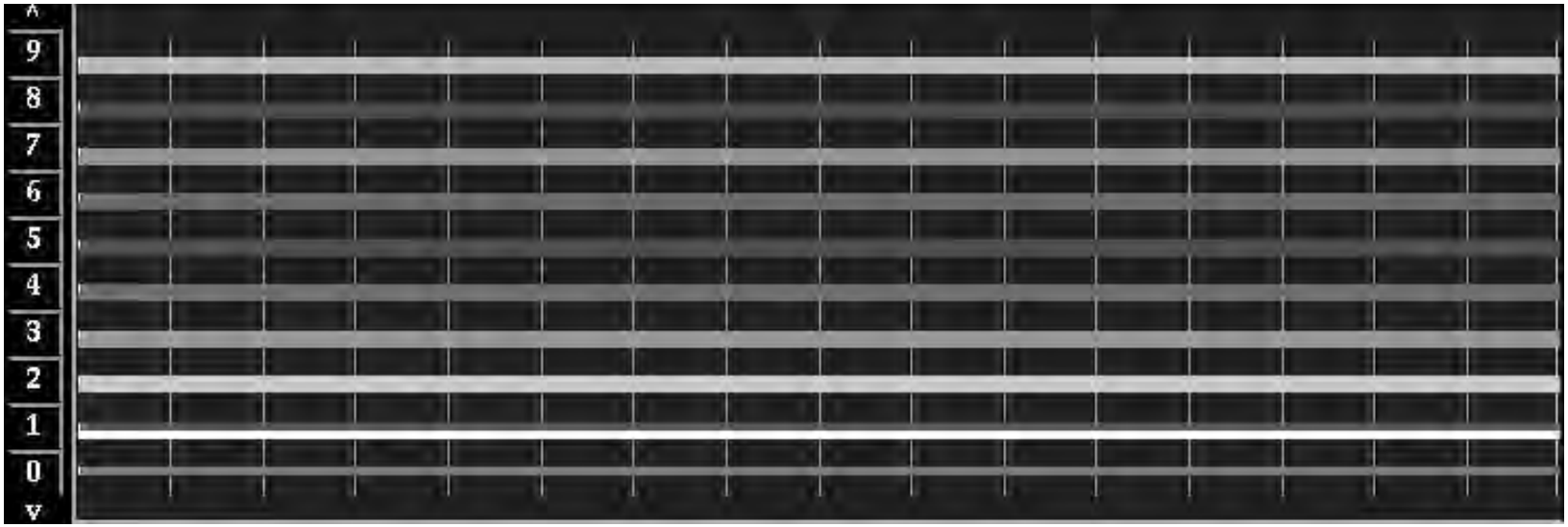

Figure 5-2. Animation Timeline

Scroll Up Button (^)

Press once to scroll the Timeline up one layer. Pressing the Scroll Up Button and holding the pen down causes the layers to scroll up continuously.

Scroll Down Button (v)

Press once to scroll the Timeline down one layer. Pressing the Scroll Down Button and holding the pen down causes the layers to scroll down continuously.

Home Button

Press the Home Button (H) to "home" the Timeline back to the 0 layer. The Home Button is in the corner of the Actor Edit Button at the left of the Timeline. For more details about the Actor Edit menu, see ***page 5-44***.

5.3 ANIMATION CONTROL MENU

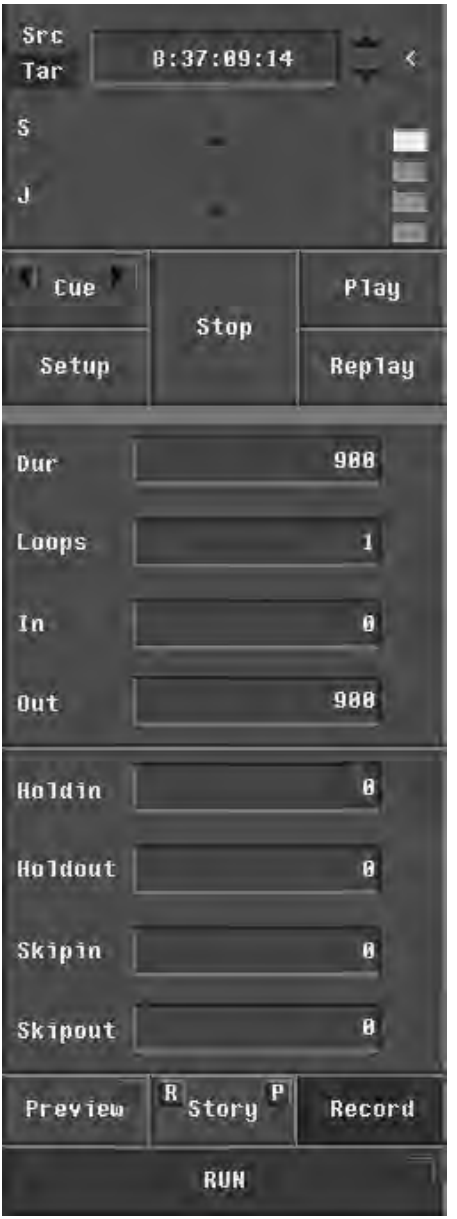

Figure 5-3. Animation Control Menu

The Animation Control Menu occupies the space along the left side of the Canvas in the Animation Environment. It controls playing back and recording animations. At the top, you use the VTR Menu to control the source and target recording devices. Below the VTR Menu are windows for setting the timing of the playback of an animation. At the bottom of the Playback Menu are buttons to control how you playback the animation.

The Animation VTR Menu

Figure 5-4. Animation VTR Menu

The Animation VTR Menu is for controlling source and target recording devices. If you want to perform rotoscoping, use the VTR Menu in the Paint Environment. (The Filmstrip Actor can also use a recording device as a source in an animation - see below, ***page 5-46***.) The Animation VTR Menu works the same as the VTR Menu in the Paint except that the rotoscope functions are missing

Source Button (src)

Press to enable the Source VTR. When this button is highlighted, all the VTR control (Play, Stop, etc.) buttons apply to the source machine. With the Source Button highlighted, press the Setup Button to call up the Source VTR Setup Popup.

Target Button (tar)

Press to enable the Target, or Record, VTR. When this button is highlighted, all the VTR control buttons (Play, Stop, etc.) apply to the record device. With the Target Button highlighted, press the Setup Button to call up the Target VTR Setup Popup.

Timecode Window

This window displays the timecode setting for the current device (source or target). The timecode window does not update continuously, because VTRs have different pre-roll periods which can cause continuous timecode reference to get lost. This “global” timecode window refers only to the single current (highlighted) device on the Source and Target Setup Popups, accessed by pressing the Setup Button. Note that this timecode setting does NOT determine where on a target device to start recording. Only the In Button below does that. (Or, if you are recording to multiple target devices, you set the time-codes in the individual time-code windows for each target device in the Target VTR Setup Popup. This (global) timecode window is only for grabbing the time-code setting from the current device, or setting a new timecode to cue the device to.

To update the timecode of the current device, press the "<" button. The timecode of the current device appears in the timecode window.

The timecode window has a set of "Bump" buttons (up and down arrows). Press on these to bump the timecode setting by one frame up or down.

Press directly in the timecode window to enter a new number. Separate the hours, minutes, seconds, and frames with spaces. 1:09:21:15 would be typed 1 9 21 15. Typing just "5" appears as 0:00:00:05.

Shuttle Button (S)

Press and drag to shuttle the VTR forward or backward. When you let up, the VTR continues to shuttle at the current rate and direction until you press and drag again, or press the Stop VTR Button.

Jog Button (J)

Press and drag to jog the VTR forward or backward. When you let up on the pen, the VTR stops.

Timecode Elevator

You can store four timecode positions in the four levels of the elevator.

Cue Button

Press to cue the current device to the setting in the timecode window.

Stop Button

Press to stop the current device.

Play Button

Press to play the current device.

Replay Button

Press to replay the current animation on the Time-line just recorded on the current device. (Uses the In and Out settings below).

VTR Setup Popups

Figure 5-5. Source (Target) Setup Popup

NOTE

The Source and Target Setup Popups are identical in appearance except that the Source Popup has a large blue button at the top, labeled "Source," and the Target Setup Popup has a large pink button at the top, labeled "Target." Each popup provides for the configuration of six possible devices (VTRs, DDRs etc.) and six possible disk paths.

Timecode/Frame Number Controls

Each device and disk path has separate controls for setting timecode. You can set up for either timecode or frame mode by toggling the Show Timecode/ Show Frame Number Button at the lower right corner of the Popup.

Each of the six devices has the following timecode controls:

- **A Timecode Window for entering time code.**
- **Timecode "Bump" Buttons that allow you to bump the timecode up or down one increment.**
- **A Timecode Input Button (>) that takes the current timecode from the device.**
- **The six disk paths have the same timecode controls, except for the Timecode Input Button.**

Reset All Button

Resets the entire Setup Popup, including clearing the disk path windows.

Reset Time Button

Resets all timecode windows in the Setup Popup to zero.

Reset Src/Tar Button

Resets all of the Source/Target Selection Buttons to "Off."

Rescale Button

When active automatically re-scales the source or target images (see below for details in the Source Setup Popup and the Target Setup Popup).

Preroll Button

For source and target VLAN-controlled VTRs. The default pre-roll is 5 seconds. On some VTRs you may want to set up a shorter pre-roll, but be careful that you don't create locking problems if you set it too short. If you are experiencing locking problems, you may want to set the pre-roll at longer than 5 seconds. The range is 1 to 15 seconds.

To change the pre-roll:

- 1. **Press on one of the source/target devices (VTR 1, VTR 2, etc.) to enable it.** The button you press is highlighted.
- 2. **Press the number window in the Pre-roll Button to enter a new pre-roll duration in seconds.** Only the active recording device is changed (it must be a VLAN-controlled VTR).

Dropframe Button

Press the Dropframe Button to turn it on/off. When on, recording/grabbing takes place in Dropframe Mode. Dropframe Mode affects both the source and target recording device (unlike Pre-roll). Note that

the Dropframe button is only active when a VTR device is selected. It is not active, nor is it needed, for disk paths.

Show Timecode/Show Frames Button

Press this button to change between Timecode Mode and Frame Mode. This affects the display of all numbers in the VTR Panel.

Source Setup Popup

NOTE

The Source and Target Setup Popups are identical in appearance except that the Source Popup has a large blue button at the top, labeled "Source," and the Target Setup Popup has a large pink button at the top, labeled "Target." Each popup provides for the configuration of six possible devices (VTRs, DDRs etc.) and six possible disk paths.

Source Selection Buttons

At the right of each of the twelve timecode windows on the Source Setup Popup is a Source Selection Button, which you can toggle between Off, Canvas, Temp, and Mask. When the button is off, that device or disk path is not active. Any of the other three modes causes the device/disk path to be an active source. Choosing Canvas, Temp, or Mask causes the input images to be routed to the corresponding buffer in the Paint Environment during grabs and rotoscoping. Clicking repeatedly on the window cycles through the choices. For a normal Canvas render when only one device is highlighted, you need not enable the Source Selection Button. By default the highlighted (current) device is used as the source. When more than one device button has

been configured, you can set all the devices to Off and only the current (highlighted) device is used as a source.

When using Temp or Mask as a source mode, use the number window at the right to set which number Temp or Mask to use. That source will then be input to Temp 1, Temp 2, etc.

To set up a source device:

- 1. **On the VTR Panel press the Source Button (src).** The button is highlighted.
- 2. **Press the Setup Button.** The Source Setup Popup appears.
- 3. **Press on one of the source devices (VTR 1, VTR 2, etc.) to enable it.** The button you press is highlighted.
- 4. **Choose Off, Canvas, Temp or Mask on the Source Selection Button.** Will default to Canvas if only one device is set up.
- 5. **Enter the source timecode in the timecode window.** This should be the start point of the source sequence.
- 6. **Press OK.** The popup disappears. The indicated device(s) will be used as source.

Note that when the Source VTR set-up button is accessed, a popup labeled “VTR’s have not been configured. Do it now?” may appear. This indicates that a physical device has been previously assigned to the current VTR using the Video Configuration Panel (section 3.6). Press yes or no, depending on whether you want to initialize the interface to that device.

To set up a source hard disk path:

- 1. **On the VTR Panel press the Source Button (src).** The button is highlighted.
- 2. **Press the Setup Button.** The Source Setup Popup appears.
- 3. **Press on one of the Disk Buttons (Disk 1, Disk 2, etc. - not the windows) to set it up as a source.** The Disk Button you press becomes highlighted.
- 4. **Press on the window in the highlighted Disk Button.** The File Popup appears.
- 5. **Type in a filename to begin the source path.** There must be a number in the filename. Usually it would be the starting number 0 or 1.
- 6. **Enter the source timecode in the timecode window.** This should be the start point of the source sequence. Use the Show Timecode/ Show Frames Button at the right to select which mode you want (often you will use frame numbers for a disk path).
- 7. Press OK. The Setup Popup disappears. The indicated disk path(s) will be used as source.

Source Rescale Button

With a device or disk path active, press on the Rescale Button to enable it (it becomes highlighted), causing the input images to be re-scaled.

The Rescale Button controls only the current (highlighted) device/disk path. When the Rescale Button is active, you can use the X and Y windows to enter new resolutions (in pixels) for the images to be re-scaled to.

Target Setup Popup

NOTE

The Source and Target Setup Popups are identical in appearance except that the Source Popup has a large blue button at the top, labeled "Source," and the Target Setup Popup has a large pink button at the top, labeled "Target." Each popup provides for the configuration of six possible devices (VTRs, DDRs etc.) and six possible disk paths.

Liberty allows you to record to more than one target device at a time, at different resolutions, if desired. You can record either a full-color image or a matte image - a black-and-white rendering of the image's alpha channel. Liberty renders each animation frame once, saving the result in the Canvas. The frame is then output to each active Target VTR and/or disk path. The frame is re-scaled if needed for each output device, and either full color or matte information is recorded to each device.

The only difference between setting up source devices (as outlined above) and setting up target devices is that when setting up a target device, whether it is a VTR or DDR or a disk path, you have only two ways to record - (1) a full-color picture (Canvas Mode) or (2) the matte of the picture (Matte Mode).

Target Selection Buttons

At the right of each of the twelve timecode windows on the Target Setup Popup is a Target Selection Button, which you can toggle between Off, Canvas, and Matte. When the button is Off, the device or disk

path is not active. Either of the other two modes, Canvas or Matte, causes the device/disk path to be an active target.

The number windows at the right of the Target Selection Buttons are disabled, since they are used only for source devices.

For a normal Canvas render when only one device is highlighted, you do not need to enable the Target Selection Button. By default the highlighted (current) device is used as the target, and Canvas Mode is used. When more than one device button has been configured, you can set all the devices to Off and only the highlighted device is used as a target.

To set up a target device:

- 1. **On the VTR Panel press the Target Button (tar).** The button is highlighted.
- 2. **Press the Setup Button.** The Target Setup Popup appears.
- 3. **Press on one of the target devices (VTR 1, VTR 2, etc.) to enable it.** The button you press is highlighted.
- 4. **Choose Off, Canvas, or Matte on the Target Selection Button.** Will default to Canvas if only one device is set up.
- 5. **Enter the target timecode in the timecode window.** This should be the start point of the record sequence.
- 6. **Press OK.** The popup disappears. Recording will now use the indicated device(s) as target.

To set up a target hard disk path:

- 1. **On the VTR Panel press the Target Button (tar).** The button is highlighted.
- 2. **Press the Setup Button.** The Target Setup Popup appears.
- 3. **Press on one of the Disk Buttons (Disk 1, Disk 2, etc. - not the windows) to set it up as a target.** The Disk Button you press becomes highlighted.
- 4. **Press on the window in the highlighted Disk Button.** The File Popup appears.
- 5. **Type in a filename to begin the target path.** There must be a number in the filename. Usually it would be the starting number 0 or 1.
- 6. **Enter the target timecode in the timecode window.** This should be the start point of the record sequence. Use the Timecode/Frame Button at the right to select which mode you want (often you will use frame numbers for a disk path).
- 7. Press OK. The Setup Popup disappears. Recording will now use the indicated disk path.

The Disk Path File Type Buttons

Every target disk path has a File Type Button at the right of its File Window. Press this button to bring up a File Type Popup that allows you to choose from Liberty's wide range of file formats for the images to be saved.

File Type Popup

Figure 5-6. File Type Popup

The File Type Popup allows you to choose from Liberty file formats and External file formats for still images and Clip file formats for animations.

External Image File Formats

The normal still image file formats from the Save As Popup, such as TIFF and Targa.

Liberty Image File Formats

Standard Liberty .im and Liberty Layers file format. Note that saving the Layers files is useful in the Paint environment, when using the Temp Layers feature (see p4-447). You would not normally render to Layers files in Animation.

Clip File Formats

Raw YUV for use with disk arrays (such as Ciprico, MegaDrive, or Eurologic; see the Liberty Technical Reference manual) and the Chyron Motion File Format for realtime playback on iNFiNiT.

Chyron Motion File Format

With this file format you can render animations to a format that contains all the frames under a single file name. When the render is finished, you can transfer the file to the iNFiNiT for realtime playback. The VTR Panel in the Paint Environment (page 4-409) has the same access to saving in the Chyron Motion File Format.

Note that when saving to a Chyron Motion File, the disk path's frame numbers must always start with zero. For example, when recording to a Chyron Motion Path in the Animation Environment, the "In" frame number/timecode must be zero, or the record will fail. This is because the software uses frame

zero to trigger the start of a Chyron Motion File. Once you've created a Chyron Motion File, however, you can record to different frames within it by altering the target disk path's frame number accordingly (for example, for a fix, you could re-render frames 10 - 20 over the original frames 1- -20).

When rendering to a Chyron Motion File is finished, you can transfer the file via FTP to a remote directory on an iNFiNiT! or other system. The File Type Popup contains a Setup Button which is active only when the Chyron Motion File Type is selected. This button brings up the Chyron Motion File Setup Popup, which allows you to enter the host and directory path names of the remote system where you want to store the Chyron Motion File.

Chyron Motion File Setup Popup

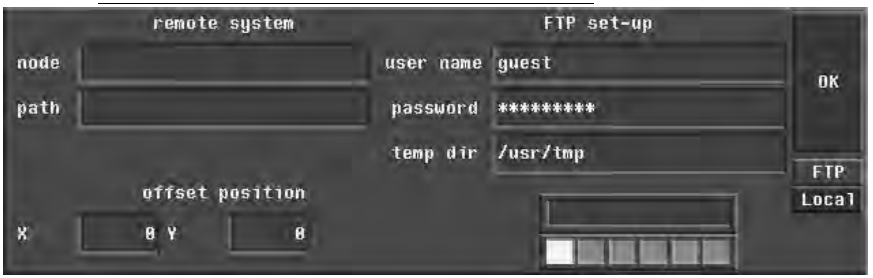

Figure 5-7. Chyron Motion File Setup Popup

The Chyron Motion File Setup Popup allows you to enter set-up information to log on to a remote system.

Node

Enter the node name of the remote system (such as "iNFiNiT").

Path

Enter the path of the directory on the remote system you wish to access (such as C/logos/message)

User Name

Enter the user name used to log on to the remote system (such as "guest"). This user name must correspond to a user account on the remote system.

Password

Enter the password used to log on to the remote system. This password must correspond to the password for the user account on the remote system.

Temp Directory

Enter a temporary directory on the local hard drive where temporary files can be stored. Normally this is set to "usr/tmp," but you can specify a different location if space is tight on the "usr" drive. All files browsed or recalled via FTP pass through this temporary directory, so it needs at least a few megabytes of free space.

X,Y Offset Position

The Chyron Motion File Setup Popup contains text windows for X and Y offset position. Since Chyron Motion Files are usually small cutouts, you can use these windows to specify the position of the cutout. The cutout then will be displayed at this position on the iNFiNiT!

FTP Settings Elevator

Use the six levels of the elevator to save settings for different remote hosts/directories.

FTP/Local

If the FTP Button is on, the file is transferred via FTP to the specified remote host and directory. If the Local Button is also on, the file is saved to the local hard drive as well.

If only the FTP Button is on, the file will be deleted from the local hard disk after the FTP.

As described above, the Chyron Motion File Type must be enabled on the Target VTR Setup Popup, and the Animation rendering must be complete (or when rotoscoping the “Last” Button must have been pressed). When the FTP transfer is about to occur, the software checks to see if the file already exists in the remote directory. If it does, you are prompted to confirm that you want to over-write the file. If you answer "Yes", the FTP transfer will commence. When the transfer finished, the message "FTP Transfer Complete" is displayed in the Prompt Window. If the FTP transfer fails, a red error message appears in the Prompt Window (for example, if the user name or password for the remote system is incorrect).

Re-scaling for Realtime Playback

To achieve realtime playback on the iNFiNiT!, Chyron Motion Files must normally be limited in size (for example, 224 x 200 pixels). You can do this most easily using the Rescale Button in the Target VTR Setup Popup (***page 5-22***), where you can enter the target X and Y resolution for each disk path. For example, turning on Rescale and setting the X and Y rescale controls to 224 and 200 would cause each rendered frame to be re-scaled to 224 x 200 before being written to the Chyron Motion File.

Recalling Chyron Motion Files

You can recall Chyron Motion Files using the Recall and File Manager Tools, just like any other image file format. This only recalls the first frame in the clip, however. To recall multiple frames in the clip, you must select the file as a disk path in the Source VTR Setup Popup (***page 5-19***). The Grab Button (in Paint) will then grab individual frames from the Chyron Motion File, based on the disk path's source timecode/frame number. Or, the Filmstrip Actor in Animation can be used to input frames from the file (to do this, put the Filmstrip Actor in Source VTR mode, and assign the file as the disk path for Source VTR; see page 5-120 for more details).

Note also that Chyron Motion Files do not currently have browse images, nor are they browsable as film-strips in the Full-Screen File Manager.

RAW YUV Files for Disk Arrays

This format is utilized for rendering animations (or rotoscoping in Paint) to a format that contains all the frames under a single file name (a clip file). This format is normally used to render or rotoscope to a Disk Array such as the Ciprico, MegaDrive, or EuroLogic Disk Array.

Note that when first saving to a RAW YUV clip file, the disk path's frame numbers must always start with zero. For example, when first recording to a RAW YUV clip file in the Animation environment, the "In" frame number/timecode must be zero, or the record will fail. This is because the software uses frame zero to trigger the start of a RAW YUV clip file. Once you've created a RAW YUV clip file, however, you can record to different frames within it by altering the target disk path's frame number

accordingly (for example, for a fix, you could re-render frames 10 – 20 over the original frames 1-20).

To render to a RAW YUV clip, the RAW YUV clip file type must be enabled on the Target VTR Setup Popup. In addition, when setting up the disk path (the file pathname) for the clip, an extension of ".raw" must be added to the filename.

Once you have rendered a RAW YUV clip file, you can recall frames from the clip, by selecting the clip as a disk path in the Source VTR Setup Popup. The Grab Button (in Paint) will then grab individual frames from the clip file, based on the disk path's source timecode/frame number. Or, the Filmstrip Actor in Animation can be used to input frames from the clip (to do this, put the Filmstrip Actor in Source VTR mode, and assign the clip as the disk path for Source VTR; see page 5-120 for more details).

In addition, if the RAW YUV clip is rendered to a Disk Array, and if your SGI system has an O2, Octane, or Impact video board, you can play the clip in real-time through the video board. See the section on Showing Video from a Disk Array (see "Show Button" on page 4-155) for details on how to do this.

Note also that for the above real-time playback through the video board to work, the video clip has to be rendered in 601 PAL (720 x 576) or NTSC (720 x 486) resolution. If the canvas resolution does not match one of these, you can use the Target Rescale Button (described in the section below) to re-scale the clip to the proper resolution as it is rendered.

The Target Rescale Button

With a device or disk path active, press on the Rescale Button to enable it (it becomes highlighted), causing the rendered images to be re-scaled before being recorded. The X and Y windows specify the resolution of the re-scaled image.

The Rescale Button controls only the current (highlighted) device/disk path. When the Rescale Button is active, you can use the X and Y windows to enter new resolutions (in pixels) for the images to be re-scaled to.

Dropframe Button

Press the Dropframe Button to turn it on/off. When on, recording takes place in Dropframe Mode.

Preroll Button

The default preroll is 5 seconds. On some VTRs you may want to set up a shorter preroll, but be careful that you don't create locking problems by giving it too short a setting. If you are experiencing locking problems, you may want to set the preroll at longer than 5 seconds. The range is 1 to 15 seconds.

OK Button

Pressing the OK Button confirms all settings and removes the Setup Popup.

Recall Animation Button

Figure 5-8. Animation File Management Buttons

The Recall Button recalls only animations from the disk. It only displays animation filenames. To recall a picture from the disk, use the Canvas Button just below the Save Button.

To recall an animation from the disk:

- 1. **Press the Recall Animation Button.** The File Popup appears, showing the existing animation disk files.
- 2. **Press on an animation filename or type in a new filename.** The current animation in the Timeline is replaced by the recalled animation.

An animation is recalled with all its data, including Timeline data and data in the Playback Menu, such as duration, in/out-times, skip in/skip out-times, and hold in/hold out-times.

CAUTION

Recalling an animation from disk completely replaces the animation currently in the Timeline. Be sure you have saved your current animation to disk before recalling another one.

Animation Save Button

The Save Button saves only animations. If you want to save the current picture on the Canvas, you must go to the Paint Environment and press Save.

To save the current animation to the disk:

- 1. **Press the animation Save Button.** The File Popup appears.
- 2. **Type in a filename for the animation to be saved under, or press on an existing filename to save the current animation over the existing animation file.** If you try to save the animation over an existing file, you'll be prompted to confirm that you want to overwrite the existing animation.

An animation is saved with all its data, including Timeline data and data in the Playback Menu, such as duration, in/out-times, skip in/skip out-times, and hold in/hold out-times.

NOTE: Save your animations frequently. Since they take up almost no disk space you can save several versions of an animation as you work -- good insurance in case you need to go back to an earlier version.

Automatic Animation Save on Exiting Liberty

When you log out of Liberty, the current animation is saved and restored to the Timeline the next time you log in to your User Login Account. This can be especially handy in the admittedly *extremely* unlikely event of a crash.

Check Animation Button

Press to make sure that all files required for the current animation exist. If all the files called for in the animation exist in the right place, you are prompted: "Animation is OK." If an error is found in the animation, a pop-up appears asking if you want to continue. You can press “Yes” to continue to the next error or press “No” or “Cancel” to stop. If you stop, the actor which caused the error is highlighted.

Timecode Button (labeled Tmcode)

Press to change between Timecode Mode and Frame Mode. Liberty automatically converts frames to timecode using the currently configured frame per second rate. If Liberty is configured for NTSC, one second is calculated at 30 frames. For PAL, one second is calculated at 25 frames. For film, one second is calculated at 24 frames.

Dropframe Button (labeled Dropfr)

Press the Dropframe Button to turn it on/off. When on, recording/grabbing takes place in Dropframe Mode. Dropframe Mode affects both the source and target recording device (unlike Pre-roll). Note that the Dropframe button is only active when a VTR device is selected. It is not active, nor is it needed, for disk paths.

Duration Button (Dur)

Figure 5-9. Duration Window

The number in the Duration Window determines the overall length of the animation. You can change the duration at any time to any value. When you change the duration of an animation, all actors in the animation change their length proportionately. Usually, you can run an animation at any duration without seriously altering its content, except at very short durations, like 15 frames or under (sometimes used for quick preview purposes).

The duration can be expressed in frames or timecode (see the Timecode Button above). When you save an animation to disk, its duration is saved as well.

To change the duration of an animation:

- 1. Press in the Duration Window.
- 2. **In Frame Mode, type the number of frames that you want the animation to last. In timecode Mode, type the timecode duration that you want the animation to last.** In timecode Mode, if the animation is to be 3 seconds and 15 frames long, type 3 15, separating the seconds and frames with a space. If it is to be an even 3 seconds long, type 3 0.
- 3. When finished typing, press the Enter key.

If Liberty is configured for NTSC, one second is calculated at 30 frames. For PAL, one second is calculated at 25 frames. For film, one second is calculated at 24 frames.

The Duration Button with Add Prefix

Use the Add Prefix to add empty time at the end of the animation without changing the duration of the actors in the animation. Press the Add Prefix, then the Duration Button, then type the total longer duration. An empty space is added at the end of the animation. If there is empty time at the end of an animation, pressing the Add Prefix and then typing a smaller duration will cause the actors to keep their durations, while cutting off empty time at the end.

Timeline Frame Increment Markers

The Animation Timeline displays vertical lines marking frame increments. Liberty displays the lines at convenient intervals, changing the intervals with the duration of the animation. For example, for a duration of 30 frames there are 15 lines at 2-frame intervals. Change the duration to 60 frames and

there are still 15 lines, but at 4-frame intervals. A duration of 300 frames displays 10 lines at 30-frame intervals.

Placing the cursor inside the Timeline (without pressing down) automatically displays the animation frame number at the current cursor position. The frame number appears in the Prompt Window at the bottom of the screen. Note also that a period (" . ") is displayed after the frame number if the cursor is on the second field of the given frame

Loops Button

Press to enter the number of times for the animation to repeat. This function repeats the entire Time-line. Each animation actor has its own individual loop button as well.

In Button

Press to set the in-time on the current device. This is the start time for the animation to be recorded. If the device's target destination in the VTR menu is set, it overrides the setting of the In Button.

In Timecode Mode type the in-time, separating hours, minutes, seconds, and frames by spaces; for example: 4 17 3 15 is 4 hours, 17 minutes, 3 seconds and 15 frames.

Entering a new in-time automatically changes the out-time, while maintaining the current duration.

Out Button

Press to set the out-time on the record device. This is the end time for the animation to be recorded. You don't have to set the out-time, if you've set the in-time. Liberty automatically sets the out-time by adding the duration to the in-time.

Entering a new out-time changes the duration, while maintaining the current in-time.

Holdin Button

Press to set how long to hold the first frame of the animation. Type the number of frames or the time-code duration of the desired hold at the beginning of the animation. For VLAN connections the hold is recorded with a single command to the recording device, recording in a single, real-time pass.

Holdout Button

Press to set the hold on the last frame of the animation. Type the number of frames or the timecode duration of the desired hold at the end of the animation. For VLAN connections the hold is recorded with a single command to the recording device, recording in a single, real-time pass.

Skipin Button

Press to set the frame number of the animation at which you want recording to begin. In this way, you can skip the beginning of the animation, or if you had to abort recording earlier, you can pick up exactly where you left off. Type the frame number to begin the recording. For example, a skipin of 4 skips frames 0 through 3 and renders at frame 4.

Skipout Button

Press to set the frame number of the animation at which you want the animation to end. In this way you can record only the beginning of an animation, or cut off the end. For example, an animation of 20 frames (0 through 19), with a skipout of 18, stops after rendering frame 17.

For the following examples, these parameters apply.

- **Animation Duration = 90 frames**
- **DDR Record In Time = 450 frames**

To record the complete animation:

Render Control Menu Field	Value	Render Control Menu Field	Value
Dur	90	**HoldIn**	0
Loops	1	**Holdout**	0
In	450	**SkipIn**	0
Out	540	**SkipOut**	0

To continue rendering animation after stopping midway (frame 50):

Render Control Menu Field	Value	Render Control Menu Field	Value
Dur	90	**HoldIn**	0
Loops	1	**Holdout**	0
In	450	**SkipIn**	50
Out	540	**SkipOut**	0

To render a section of the animation timeline (frame 30 to frame 60) but start recording on the DDR at the first new frame (450 on DDR):

Render Control Menu Field	Value	Render Control Menu Field	Value
Dur	90	**HoldIn**	0
Loops	1	**Holdout**	0
In	420	**SkipIn**	30
Out	510	**SkipOut**	61

In order to render the middle section of the timeline to the beginning of the DDR the SkipIn Time must be subtracted from the In time. If the In time is left at 450, then the DDR will leave 30 frames of old material (or black) and start recording at frame 480.

To have a 15 frame freeze of the last frame in the animation:

Render Control Menu Field	Value	Render Control Menu Field	Value
Dur	90	**HoldIn**	0
Loops	1	**Holdout**	15
In	450	**SkipIn**	0
Out	555	**SkipOut**	0

Preview Animation Button (In Brief)

Allows you to preview the animation in Wireframe Mode, Outline Mode, and Render Mode.

Animation Storyboard Button (In Brief)

Allows you to render the animation as a preview movie to be played back through Liberty.

Animation Environment Record Animation Button (In Brief)

Allows you to render the animation to a recording device (VTR, DDR, hard disk, etc.)

Run Animation Button (In Brief)

Press to start rendering the animation in Preview, Storyboard, or Record Mode.

The Run corner button calls up the Run Popup to choose among various rendering options.

For more information on the Preview, Storyboard, Record, and Run buttons briefly described above, refer to the Animation Playback Functions (***§5.10*** on ***page 5-222***).

5.4 Animation Actor Menus

5.4.1 Animation Actors (in brief)

Animation actors are the basic elements of an animation. Each type of actor has a specific function and is represented by a color-coded bar in the Timeline. When you see a dark green bar, you know that it represents a Cel Actor. When you see a magenta bar, you know it represents a Morph Actor. Below is a quick introduction to the actor types.

Most types of actors call an image file from the disk and display it as part of the animation. Each actor can have its own curve path and a series of keyframes for various changes in the display of the actor's image file - size, rotation, transparency, etc.

Animation actors exist on layers in the Animation Timeline. Any number of sequential actors and any combination of actor types can exist on a single layer.

Actor Type Popup

Figure 5-10. Actor Type Popup

The Actor Type Popup displays the types of actors and their color codes. To call it up, press the center of the colored button in the Add Actor Button in the Actor Edit Menu (usually the colored button is green and says "Cel," but it may be other colors/types of actors). The Actor Type Popup appears on top of the Actor Edit Menu.

The following are brief descriptions of the actor types and their functions in an animation. Detailed descriptions of each type of actor start on page 5-106.

Cel Actor

A Cel Actor calls a single image or a group of images from disk for display in the animation. See page 5-106 for a full description of this actor type.

Cycle Actor

A Cycle Actor calls a series of images from disk and displays the sequence in the animation. The Cycle Actor takes filenames that are dissimilar and not sequentially numbered, unlike the Filmstrip Actor. The Cel Actor in Multiple Mode can perform the same operation. See page 5-119 for a full description of this actor type.

Filmstrip Actor

A Filmstrip Actor calls a sequence of images with a common name and incrementing numbers (like anim1, anim2, anim3, anim4, etc.) from disk, and displays the sequence in the animation. The Filmstrip sequence can come from another source, such as a 3D software package or a recording device. The Cel Actor in Multiple Mode can perform the same operation. See page 5-120 for a full description of this actor type.

Text Actor

The Text Actor is similar to a Cel Actor, but calls up a vector-based text image, rather than a picture file. The Text actor allows text to be greatly magnified while keeping full resolution. See page 5-129 for a full description of this actor type.

Write-on Actor

The Write-on Actor allows you to animate the current paintbrush along a curve path to create signature-type write-on animations. See page 5-131 for a full description of this actor type.

Morph Actor

The Morph Actor can use one of two different morph programs. Each animates a metamorphosis-type distortion of a single image or a morph between two images. Triangle Morph uses a triangular grid system and is the faster of the two. Line Morph uses free line segments and is much easier to use, but rendering takes longer. Line Morph gives more pleasing, organic distortions. See page 5-137 for a full description of this actor type.

Macro Actor

The Macro Actor allows you to animate a Macro as part of an animation.

Plug-in Actor

The Plug-in Actor applies a plug-in filter to the actor(s) below it.

Switcher Actor

The Switcher Actor can call an image from disk and use its alpha data to animate a reveal, or wipe. The Switcher Actor can also animate simple fades and dissolves. See page 5-154 for a full description of this actor type.

Color-table Actor (labeled Colortab)

The Color-table Actor calls up a picture file from disk and assigns its gray-scale to a set of colors chosen on the palette. Then the assigned colors can be cycled or revealed for flow effects. See page 5-159 for a full description of this actor type.

Mask Actor

The Mask Actor calls an image from disk and uses its alpha, or transparency data, to mask the actor below it. The Mask Actor has a large variety of modes for masking, including most of the effects on the Image Tools in the Paint Environment. For example, it can make a mask on the basis of brightness, to animate spotlights or shadows. Or, it can make a mask on the basis of the Ripple function, to animate liquid or glass refractions.

The Mask Actor can contain a curve path for the mask to follow during the animation, as well as keyframes for DVE-type rotation in X, Y, and Z. These keyframes also control attributes such as Transparency, Scale, Slant, Mirror, and Under. See page 5-162 for a full description of this actor type.

Reference Actor (labeled Refer)

Reference Actors allow an existing animation saved on disk to be included in other animations. You can use the Show Troupe button to expand or compress Reference (or Troupe) Actors. An expanded actor shows all the actors contained in it. A compressed actor "hides" all its actors and displays only on one layer. Reference Actors can have paths and keyframes, allowing the member actors (possibly having their own relative paths and keyframes) to move as a group. ***Reference Actors cannot be edited.***

Troupe Actor

Troupe Actors are like Reference Actors in that they refer to animation files stored on disk, but the contents of Troupe Actors can be edited, while the contents of Reference Actors cannot be edited. The Show Troupe Button affects Troupe Actors the same way as Reference Actors.

NOTE: For more information on Reference and Troupe actors, refer to ***page 5-182***.

Cinefusion Actor (Optional)

The Cinefusion Actor works with Ultimatte's Cinefusion software to allow you to create animated mattes.

Shapes Actor

The Shapes Actor allows you to animate polygons as part of an animation.

Rotation and Scaling of Actors Larger Than the Screen

You can pan, rotate, scale, and slant actors created at a higher resolution than the display screen. This means that they are larger than the screen in which you are rendering animation. These larger actors can be Cel Actors, Mask Actors, or Switcher Actors. A Temp or Mask Buffer large enough to hold the larger file is temporarily allocated to do this. You'll need sufficient RAM to support this.

5.4.2 Actor Edit Functions

Figure 5-11. Actor Edit Buttons

To create an animation from scratch you start with the Actor Edit Functions. You use the Actor Edit Menu (at the left of the Timeline) to put different types of actors into the Timeline, to move or copy them, to change their length, and to delete them.

Each Actor Edit Button turns off after performing an operation once, except the Main Actor Edit Button. To perform repeated actor edit operations, press the Repeat Prefix Button before pressing an Actor Edit Button.

Only one Actor Edit Button can be active at a time.

Main Actor Edit Button

Press the Main Actor Edit Button to end any Actor Edit function. The Main Actor Edit Button ("Edit") is active by default, indicating that no other Actor

Edit Buttons are active. When any other Actor Edit Button finishes an operation, the Main Actor Edit Button becomes active again.

Home Button (Corner of Main Actor Edit)

Press the Home Button in the corner of the Main Actor Edit Button to "home" the Timeline to the Zero layer. When you have scrolled away from this layer on the Timeline, this button resets the Zero layer to the second line from the bottom.

Add Actor Button

To add an actor to the Timeline:

- **Press the Add Actor Button**.
- **Press in a layer of the Timeline at the point that you want the actor to begin**.
- **Press a second time (in the same layer) at the point that you want the actor to end.** The actor appears between the two indicated points. The begin and end times of the actor appear in its Actor Popup at the right of the Timeline.

NOTE

To automatically fill up all the space in a layer with the added actor, double-click in the layer.

Actor Type Popup

The type of actor that is added is determined by the color-coded Actor Type Button in the Add Actor Button. To change the actor type displayed in the Actor Mode Button, press on the Actor Type to call up the Actor Type Popup (see the illustration ***"Actor***

Type Popup" on page 5-45). You can also cycle through the actor types by pressing repeatedly on either end of the color-coded Actor Type Button.

The Add Actor Button can also be used to insert layers in the Timeline. Instead of pressing inside the Timeline, press on one of the Layer Number Buttons. Pressing on the top half of the Layer Number Button adds the new layer above the layer you pressed on. Pressing on the lower half of the Layer Number Button adds the new layer below the layer you pressed on.

Delete Actor Button

To delete an actor from the Timeline, press the Delete Actor Button (labeled Del) and then press on the actor you want to delete in the Timeline. If you want to delete several actors, press the Repeat Prefix Button before pressing the Delete Actor Button. Don't forget to turn Repeat off when you're finished (or press the Main Actor Edit Button).

To delete an entire layer from the Timeline, press the Delete Actor Button and then press on the layer number button of the layer you want to delete. All the actors in the layer are deleted, and it is removed from the Timeline.

Delete Timeline Button (Corner of Del Button)

To delete all the actors in the Timeline press the corner button in the Delete Actor Button. A popup appears asking you to confirm the deletion of the entire animation. Press YES to confirm the deletion. Press NO to make no modification to the animation. Press CANCEL to abort the deletion. (NO and CANCEL have the same effect.)

Off Button

The Off Button allows you to turn an actor off without deleting it, so it doesn't appear when the animation is played back. This is useful when you want to preview only certain actors in an animation.

Press the Off Button and then press on the actor in the Timeline that you want to turn off. A red line appears along the actor to show that it is turned off. The procedure to turn the actor back on again is exactly the same.

To turn off an entire layer (turn off all the actors in a layer at once) press the Off button and then press on the layer number button. All the actors are turned off. Or, if the actors in the layer are already off, they are turned on again.

Off Timeline Button (Corner of Off Button)

Turns off all actors on the timeline. When used with the **invert** prefix, turns on all actors on the timeline.

Move Actor Button

To move an actor to another place on the Timeline:

- **Press the Move Actor Button.**
- **Press on an actor and drag it to its new position.** You don't have to press down while you drag.
- **Press again when the actor is in its new position.** You can move an actor within the same layer or to a different layer.

If there is not enough space for the moved actor in its new position, it can't be moved there.

To move an entire layer to another place on the Timeline:

- **Press the Move Actor Button.**
- **Press on the Layer Number Button of the layer you want to move.**
- **Press on another Layer Number Button.** Pressing on the top half of a Layer Number Button puts the moved layer above it; pressing on the bottom half of a Layer Number Button puts the moved layer below it.

Copy Actor Button

The Copy Actor Button works the same as the Move Actor Button, except that the source actor (or layer) is not removed by the operation. A copied actor has all the attributes as the original.

To copy an actor on the Timeline:

- **Press the Copy Actor Button.**
- **Press on an actor and drag it to the position to be copied to.** You don't have to press down while you drag.
- **Press again where you want the new copy of the actor.** A copy of the actor appears in the new position.

You can copy an actor within the same layer or to a different layer.

If there is not enough space for the copied actor in its new position, it can't be copied there.

To copy an entire layer to another layer on the Timeline:

- **Press the Copy Actor Button.**
- **Press on the Layer Number Button of the layer you want to copy.**
- **Press on the top or bottom half of the Layer Number Button of the layer where you want to put the new copy of the layer.** A copy of the layer appears in the new position. Pressing on the top half of a Layer Number Button puts the new copy of the layer above that layer; pressing on the bottom half of a Layer Number Button puts the new copy of the layer below it.

To copy only an actor's curve path to another actor, see the Edit Path Button. To copy only an actor's keyframes to another actor, see Copying Keyframes to Another Actor.

Stretch Actor Button

Use the Stretch Actor Button to make an actor longer or shorter.

To change the begin time of an actor:

- **Press the Stretch Actor Button.**
- **Press on the first half of the actor to be modified.**
- **Press on the new begin point.** The actor stretches or shrinks to the point you press on.

To change the end time of an actor:

- **Press the Stretch Actor button.**
- **Press on the last half of the actor to be modified.**

- **Press on the new end point.** The actor stretches or shrinks to the point you press on.

To stretch all actors in a layer to the maximum available space:

- **Press the Stretch Actor Button.**

- **Press on the Layer Number Button of the layer in which you want to stretch all actors to the maximum available space.** The first actor in the layer changes its begin-time to 0. The other actors maintain their original begin-times and stretch their end points to fill all available space in the layer.

Stretching with the Begin/End Windows

In the Actor Popup at the right of the Timeline, there are two number windows which display the begin and end frames of the actor. Press on these number windows to type in new begin or end times. Changing the begin-time moves the actor without changing its length; changing the end time changes the actor's length without moving it in the layer.

Show Troupe Button

This button is used with Troupe and Reference Actors. Pressing the Show Troupe Button, and then pressing a Troupe or Reference Actor either expands or compresses the actor. An expanded actor shows all the actors contained in it. An compressed actor hides all its actors and displays only on one layer.

Compress Button

Deletes all empty layers in the Timeline.

5.4.3 Actor Popups

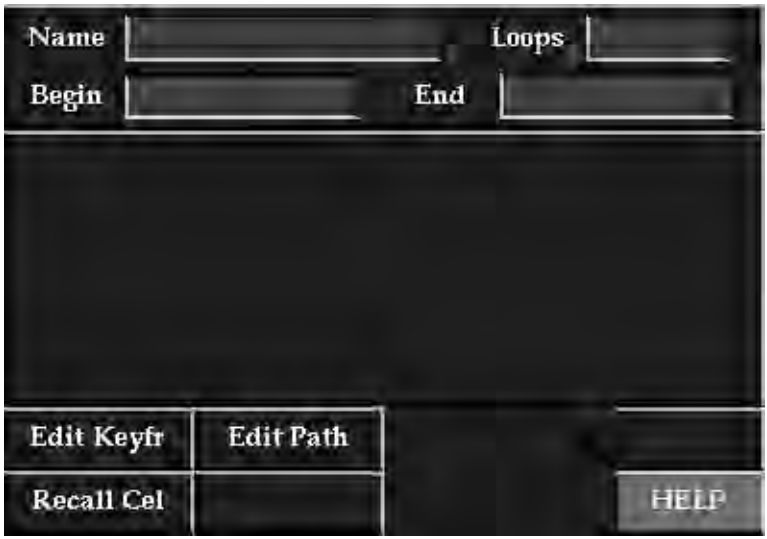

Figure 5-12. Basic Actor Popup (no actor selected)

Each type of animation actor has its own popup menu with functions specific to that type of actor. When you select an actor by pressing on it in the Timeline, the popup menu for that actor appears at the right of the Timeline. Use the buttons on this popup to edit the actor. You can select only one actor for editing at a time.

To edit the functions of an actor, press on the actor in the Timeline. The actor becomes underlined in white. Its Actor Popup appears at the right of the Timeline, containing the data for that actor (beginning and ending frame numbers, filename, etc.).

The two top rows and one bottom row of the Actor Popups always have the same buttons. The middle section of the Actor Popup varies with actor type.

Actor Name Window

You can assign a name to any actor simply as a reminder of the contents of the actor, but it's not necessary to give an actor a name.

To assign a name to an actor, or change the current name:

- **Press the Actor Name Window.**

- **Type a name for the actor.** The name you type appears in the Actor Name Window. The actor keeps this name until you change it.

Actor Loops Window

The Actor Loops Window allows you to type in a number for how many times the actor is to repeat. Only the individual actor repeats, not the entire animation.

To set the number of times the actor is to repeat:

- **Press the Actor Loops Window.**

- **Type in the number of times you want the actor to repeat.** The new number appears in the Actor Loops Window. When you play back the animation, the actor repeats this many times.

An actor loops within its duration. For instance, if an actor with a duration of 30 frames has 3 loops, it makes three 10-frame loops.

If the actor is using a curve path, closing the path makes a smooth loop. See Actor Edit Path, page 5-44.

Actor Begin and End Windows

The Actor Begin Window displays the current actor's beginning frame number (or timecode number). This number (if other than zero) changes automatically if the duration of the animation is changed.

The Actor End Window displays the current actor's ending frame number or timecode number. This number changes automatically if the duration of the animation is changed.

The actor's beginning and ending may be displayed in either frame mode or timecode, depending on the Frame Number/Timecode Button (labeled Tmecode) in the Playback Menu at the upper left of the Animation Environment. An actor's beginning and ending changes proportionately with changes in the duration of the whole animation.

If you want to change an actor's position or length on the same layer, you can reset the Begin and/or End Actor Windows, rather than use the Move or Stretch Actor Buttons. This gives you frame-accurate precision.

NOTE

Subtracting the beginning frame number from the end frame number gives the duration of the actor.

To move an actor within the same layer using the Actor Begin Window:

- **Press the actor to select it.**
- **Press in the Actor Begin Window and type the new beginning number.** The actor moves to its new beginning point while maintaining its duration.

To stretch an actor using the Actor End Window:

- **Press on the actor to select it.**
- **Press in the Actor End Window and type the new ending number.** The actor stretches to its new ending number while maintaining its original beginning number.

Edit Keyframe Button

The Edit Keyframe Button allows you to assign many attributes to an actor on a curve path, including DVE-type rotations, scaling, transparency, mirror and slant settings. It also allows you to modify the speed and acceleration of the curve path and other attributes. When you press the Edit Keyframe Button, the Keyframe Timeline appears over the Timeline. Details of creating and editing keyframes begin on page 5-65.

Edit Path Button

The actor's curve path controls the motion of the actor. The Edit Path Button calls up the Curve Popup and displays the actor's current path, if any, on the Canvas. Here you can create a new curve path or change the current curve path.

NOTE

The top Curve Elevator level is used for the current actor's animation curve path. The other elevator levels can be used for temporarily storing curves - for example, for copying to other actors.

Curve Functions in Animation

Figure 5-13. Curve Popup

Some functions on the Curve Popup have special applications to animation keyframes. They are listed here:

Insert Point Button

This button (labeled Insrt) allows you to insert points along the curve.

To insert points in an existing curve:

- **Press the Edit Path Button**. The Curve Popup appears with the existing curve displayed.
- **Press the Insert Button**.
- **Press on the curve where you want the new point to appear**. The point is added and the curve is modified. A corresponding Keyframe Matchstick is added to the Keyframe Timeline.

Duplicate Points Button

This button (labeled Dup) allows you to exactly duplicate a point on the curve. You can use this to make a hold in the middle of an actor, since duplicating a point adds a Keyframe Matchstick with exactly the same x,y position as the existing one. You can then adjust the matchsticks on the Keyframe Timeline to set the length of the hold.

To make a hold using the Duplicate Button:

- **Press the Edit Path Button**. The Curve Popup appears with the existing curve displayed.
- **Press the Dup Button in the Curve Popup**. It becomes highlighted.
- **On the Canvas, press on a point in the middle of the path.** Another point is added exactly on top of the point you pressed. Though the Keyframe Timeline is not displayed, a corresponding matchstick is added just after the original matchstick.
- **Press the Edit Keyframe Button.** The Curve Popup disappears and the Keyframe Timeline appears, displaying the new matchstick next to its original.

- **Use the Move Matchstick Button to move the duplicate matchstick, thus setting the duration of the hold.**

On the curve, duplicated curve points are colored the same color as the tangents (default is yellow) to distinguish them from single points.

When the Duplicate Points Button is enabled and you move the cursor near a point, the point you are nearest to will flash, as a preview of which point will be duplicated when you press down.

To separate two duplicate keyframe positions, go into Edit Path and use the Move function to manually drag one point away from its duplicate. When editing keyframes in the Keyframe Timeline, duplicated points always move as a unit - thus you must go into curve editing in order to separate them.

The Move Gravity Function

This function on the Curve Popup combines the Gravity Button and the Move Points Button. When the Gravity Button is on, the Move Button will snap the point being moved to any point it gets close to. This allows you to lock curve points together after the points have been added. Thus two existing points can be made into duplicates in order to create a animation keyframe hold.

Point List Button

Press this button to recall Point Lists, which are curves created with the Motion Tracking function in the Image Tools 2 Panel in the Paint Environment. If the Motion Tracking option is not installed, the Point List Button will be grayed out.

Pressing Point List brings up the file popup, allowing you to select the desired point list file.

The tracked element can be anything that can be distinguished from its surroundings in some way, usually by its luminance value. The Tracking function will create a series of points, generating a motion curve path, which is saved on disk as a Point List. Or it will generate a set of four points defining a warp rectangle that follows an area in the target sequence, which is saved on disk as a Corner List, which you can recall using the Corners List Button.

To recall a Point List you must have first created one, using the Motion Tracking option in the Image Tools 2 Panel in the Paint Environment. For this procedure, see below.

Corners List Button

The Corners List Button is used to recall a Corners List, which is a special type of file created with the Motion Tracking functions in the Image Tools2 Panel in the Paint Environment. If the Motion Tracking option is not installed, the Corners List Button will be grayed out. The Tracking function will create a series of points, generating a motion curve path, which is saved as an animation Curve Path and can be recalled with the Point List Button. Or it will generate a set of four points defining a warp rectangle that follows an area in the target sequence, which is saved as a Corners List and is recalled with the Corners List Button.

Pressing the Corners List Button brings up the File Popup, allowing you to click on the desired Corners List file.

Recall Cel Button

Press to recall the actor's image file from the disk to the Canvas. All actor types use Recall Cel except: Text, Write-on, Morph, Macro, Reference, Troupe, and Shapes. These actor types have no image file associated with them.

Actor Type Button

Displays the type of the selected actor along with its color code. Actor types can be changed without loss of information. Pressing on the Actor Type Button brings up the Actor Type Popup, see page 5-45.

5.5 Animation Keyframes

Edit Keyframe Button

Press the Edit Keyframe Button, and the Keyframe Timeline (page 5-67) appears on top of the Animation Timeline. With this popup you can create keyframes which determine DVE-type moves and other attributes of the selected actor. You can vary the speed and acceleration of the actor's attributes, including its motion along its curve path.

5.5.1 Keyframe Timeline

The Keyframe Timeline has two parts: the Keyframe Timeline on the right and the Keyframe Edit Menu on the left.

The Keyframe Timeline shows at the top the actor's timeline with triangular curve path points and keyframe matchsticks. The rectangle across the bottom contains the Speed Curve, which you can use to vary the speed and acceleration of the actor's attributes.

The Keyframe Edit Menu, at the left of the Keyframe Timeline, contains buttons for interacting with the Keyframe Timeline - adding and editing keyframes as well as editing the Speed Curve.

Frame Numbers in Keyframe Timeline

When the cursor is moved over the Keyframe Timeline (without pressing) both the relative and absolute frame numbers of the cursor's position on the timeline are displayed in the Prompt window (at the bottom of the screen).

Peek

Peek shows a wireframe preview for the corresponding frame on the timeline. To Peek, press the cursor down on the green bar on the Keyframe Timeline to show the corresponding wireframe preview.

Keyframe Edit Menu

The upper part of the Keyframe Edit Menu (above the green OK button) contains buttons to add, delete, and move keyframes in the Keyframe timeline. These buttons, labeled "Add", "Del", and "Move", are at the top of the Keyframe Edit Menu. This portion of the menu also contains a 5-level elevator, with buttons for saving and recalling keyframes in the elevator (labeled "sav", "all", and "rec").

The lower portion of the Keyframe Edit Menu (below the OK button) contains buttons related to the Speed curve, including buttons to Add and Delete Speed Nails, a 5-level elevator, and controls for recalling/saving speed nails. It also contains in/out buttons for zooming the speed curve display, along with a SubPixel button to enable sub-pixel positioning. See ***§5.6*** for more information on the Speed Curve.

Figure 5-14. Keyframe Timeline

About Keyframes and Keyframe Matchsticks

On the Keyframe Timeline, keyframes are displayed as blue keyframe "matchsticks". When an actor is created, Liberty automatically adds start and end keyframes to it. These keyframes have no attributes, and thus no effect, until edited. The animation actor's disk image file is displayed as it exists on the disk. If the actor has a curve path, the image file moves along the path with no changes in the way it is displayed. By editing the start and end keyframes and adding new keyframes to the Keyframe Timeline you can change attributes of the display of the actor's image file. The following attributes are controlled by keyframes:

- **X,Y,Z rotation of the image. (Same as Paste Distort in Paint Environment).**
- **X,Y size of the image. (Same as Paste Distort in Paint Environment)**
- **X,Y mirroring of the image. (Same as Paste Distort in Paint Environment)**
- **Slanting of the image. (Same as Paste Distort in Paint Environment)**
- **Position of the Reference Point of the image. (Same as Paste Distort in Paint Environment)**
- **Transparency of the image.**
- **Whether the image is displayed under other actors.**
- **Many of the individual attributes of the actor types**
- **Filter Type: point, bilinear, adaptive, or user-defined**

Colored Dots on Matchsticks

On the Keyframe Timeline keyframe matchsticks display little colored dots depending on which attributes have been changed for that keyframe. The following colors are used to denote attribute dots, starting at the top of the keyframe matchstick and working down:

- **Light green - transparency**
- **Red - rotation**
- **Yellow - scaling and mirroring**
- **Purple - slant**
- **Light blue - under**

The lack of a colored dot on a matchstick means that at this keyframe the display of this attribute is interpolated from other matchsticks. For example, if there are three keyframes on the timeline, and the first one is completely transparent, and the last one is completely opaque, then the middle one does not need to have a transparency specified. It will have no light green dot, but it will still be halfway transparent, interpolating its value from the other two keyframes.

When an animation is saved to disk all its keyframe data is saved as well.

5.5.2 Adding and Editing Keyframes

Use the Edit Keyframe Menu to add keyframes to the Keyframe Timeline. You can add as many keyframe matchsticks as you want anywhere on the Keyframe Timeline.

NOTE

There can be, at most, one keyframe per field on the Timeline. A warning message will be displayed if the user attempts to add a keyframe to a field already containing one.

If the actor has no curve path, any added keyframes take their X, Y positions from the original position of the image file as saved on the disk. If the actor has no curve path and you change the X, Y positions of a keyframe on the screen, Liberty creates and displays a curve path accordingly (see details of editing keyframes, page 5-70).

Add Keyframe Button

To add a keyframe to the Keyframe Timeline:

- **Press the Add Keyframe Button.**

- **Press somewhere in the space above the green Keyframe Timeline bar.** A keyframe matchstick appears above the timeline. The new keyframe matchstick has no data when you add it to the timeline. You will edit it to change its attributes (see details of editing keyframes, see page 5-70).

Delete Keyframe Button

To delete a keyframe from the Keyframe Timeline:

- **Press the Delete Keyframe Button.**

- **Press on a keyframe matchstick in the Keyframe Timeline.** The matchstick you press on disappears from the timeline. All its attributes are deleted as well.

NOTE

It is impossible to delete or move the beginning or ending matchstick.

Move Keyframe Button

To move a keyframe on the Keyframe Timeline:

- **Press on the Move Keyframe Button.** The Move Keyframe Button lights blue.
- **Press and drag the keyframe matchstick to move it to its new position.** The Move Button turns off.

Keyframe Elevator

The five-level Keyframe Elevator is just above the keyframe OK Button. It does not work like any of the other elevators in Liberty. Use the Save Keyframe Button to save keyframe matchsticks into the Keyframe Elevator. Use the Recall Keyframe Button to recall keyframe matchsticks from the Keyframe Elevator.

Keyframe Save Button

To save a keyframe matchstick into the Keyframe Elevator:

- **Press on the matchstick to be saved.** It becomes highlighted. (This is also the way you select a matchstick for editing - the wireframe of the keyframe appears on the Canvas and the Keyframe Attribute Popup appears.)
- **Press on the Save Keyframe Button (Sav).** The keyframe is saved in the current elevator level (highlighted light blue).

- **Press the Keyframe OK Button.** This removes the selection from the matchstick and makes the popup disappear.

Keyframe All Button

The Keyframe All Button is a mode button that, when on, causes all the keyframe matchsticks in the Keyframe Timeline to be recalled/saved into the current elevator level when you press the Keyframe Recall/Save Button. When off, only the single selected keyframe matchstick in the Keyframe Timeline is recalled/saved.

Keyframe Recall Button

To recall a keyframe matchstick from the Keyframe Elevator, press the Keyframe Recall Button. The contents of the current Keyframe Elevator level is recalled into the Keyframe Timeline and becomes part of the actor. If there is more than one matchstick stored in the elevator level, and the "All" button is on, all matchsticks are recalled into the timeline.

Keyframe Edit OK Button

Press to remove the Keyframe Edit Menu and Keyframe Timeline.

SubPixel Button

When the SubPixel Button is high-lighted the keyframes are rendered through the "warp code," so that even images which are not distorted in any way are forced to be rendered with filtering.

5.5.3 Copying Keyframes

Use the Save/Recall Keyframe functions to make copies of matchsticks on the Keyframe Timeline.

To copy a matchstick:

- **Select the matchstick you want to copy,** either by pressing on one to highlight it, or turning on the All Button under the Keyframe Elevator.
- **Press the Save Keyframe Button** to save the selected matchstick(s) into the current elevator level.
- **Move the selected matchstick in the Keyframe Timeline.** This is so when you recall the saved matchstick it isn't recalled on top of the original.
- **Press the Recall Keyframe Button.** The saved matchstick appears in the Keyframe Timeline, identical to the original matchstick.

NOTE

You can also copy keyframes by copying the entire actor containing the keyframe(s) to be copied. Another way to copy keyframe data using the Next and Prev Buttons in the Keyframe Distort Popup is discussed on page 5-79.

Copying Keyframes to Another Actor

You can use the Save/Recall Keyframe functions to copy keyframes to another actor. This is useful when you have another actor with its own, different curve path and you want to copy keyframe data only into that actor without changing its path.

To copy keyframes to another actor:

- **Select the matchsticks you want to copy**, either by pressing on one to highlight it, or turning on the All Button under the Keyframe Elevator.
- **Press the Save Keyframe Button** to save the selected matchstick(s) into the current Keyframe Elevator level.
- **Press OK to exit the Keyframe Timeline.**
- **Edit the actor to which you want to copy the matchsticks.** Press the Edit Keyframe Button to call up the Keyframe Timeline.
- **Press the Recall Keyframe Button at the same elevator level that you saved the keyframes to.** The saved keyframe(s) are recalled and appear in the actor's Keyframe Timeline.

5.5.4 Keyframe Positioning

When creating keyframe positions for a new actor, the best technique is to add the desired number of Keyframe Matchsticks to the Keyframe Timeline; then, on the Canvas, drag the keyframes to their desired positions. As you drag each keyframe, a smooth, predictable curve appears between it and the previous keyframe. You can move keyframes this way at any time.

NOTE

Keyframes can also be positioned by moving the corresponding path points in the Edit Path menu (see page 5-60). If a jagged (non-smooth) curve is desired, the Edit Path menu should be used.

Holds

Basically, in a new actor *whose keyframes haven't yet been moved*, when you drag a keyframe on the Canvas, the other keyframes will automatically have the same position, thus creating a hold.

To make an actor move, then stop and hold to the end of the actor's duration:

- **Add a new actor to the Timeline.**
- **Press the Edit Keyframe Button.** The Keyframe Timeline appears with a beginning and ending Keyframe Matchstick**.**
- **Add a Keyframe Matchstick in the middle of the Keyframe Timeline.**
- **Select the first matchstick, and on the Canvas drag the wireframe to the desired starting position.**
- **Select the second matchstick and on the Canvas drag the wireframe to the desired end (hold) position.**

The third and last keyframe will be in exactly the same position as the second keyframe, thus automatically creating a hold. Other kinds of holds use the Duplicate Curve Points Button, described above, page 5-62.

To add a hold at the beginning and end of an actor:

- **Add a new actor to the Timeline.**
- **Press the Edit Keyframe Button.** The Keyframe Timeline appears with a beginning and ending Keyframe Matchstick**.**

- **Add two Keyframe Matchsticks in the middle of the Keyframe Timeline.** This gives a total of four matchsticks.

- **Select the second matchstick and on the Canvas drag the wireframe to the desired starting position.**

- **Select the third matchstick and on the Canvas drag the wireframe to the desired end (hold) position.**

- **Run a storyboard to look at the animation.** The animation begins with a hold and ends with a hold

NOTES

The above procedure also applies to a hold at the beginning of an actor. In that case you would move the last keyframe into position first, then the middle keyframe. The first keyframe then takes on the position values of the middle keyframe.

When a pair of keyframes constitute a hold at the end of an actor, and you drag the first keyframe of the pair, the last keyframe moves as a unit with it. When a pair of keyframes constitute a hold at the beginning of an actor, and you drag the *second* keyframe of the pair, the first keyframe moves as a unit with it.

The hold characteristics of keyframes apply to the Reference Points of keyframes, as well as to their positions.

Keyframes without Curve Points

If a keyframe has not been manually moved on the Canvas, and no curve path has been added to the actor, the keyframes have no curve point and no curve path. This is the default state of a keyframe.

If a keyframe has no curve point, then its position is interpolated along the curve path from the two nearest keyframes that do have curve points.

If a keyframe has no curve point, and there are no keyframes after it with curve points, then the keyframe will assume the position of the nearest previous keyframe with curve points.

When you add a curve path to the actor, or manually move a keyframe on the Canvas by dragging its wireframe, the keyframes are automatically assigned positions on the curve path, as described in the following section.

For Each Path Point a Keyframe

When you use the Add Button in the Curve Popup to add a point to the curve path, a Keyframe Matchstick is automatically added to the Keyframe Timeline. Likewise, if you delete a point from the curve path, its corresponding matchstick will be deleted from the Keyframe Timeline, *as long as it is set to its default values*. If the corresponding keyframe has been given non-default values (for instance, if it has been manually given a rotation) then it will not be deleted. The curve point will be deleted and the matchstick will remain on the timeline with its position interpolated between its neighboring keyframes.

Keyframes and Path Points

When moving keyframes on the Canvas by dragging their wireframes, the changing path always stays smooth throughout its entire length. If you want a non-smooth curve, you can go into Edit Path and move path points and their tangents to modify the curve. However, if you then go back to editing keyframes and move keyframes on the canvas, the path will smooth out again.

5.5.5 Keyframe Distort Popup

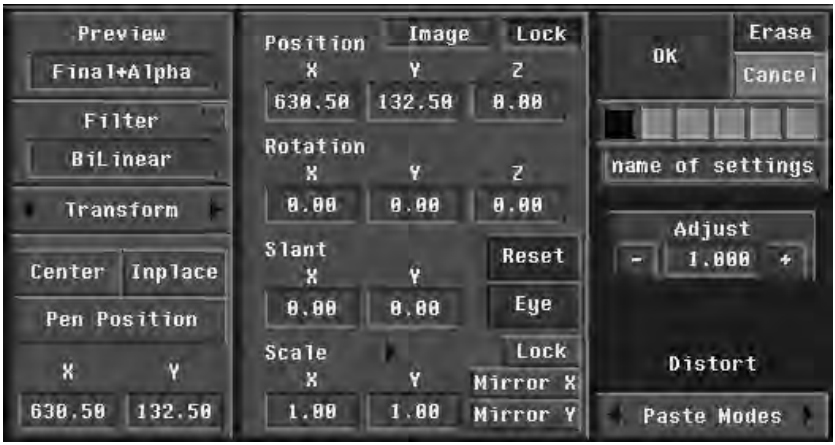

Figure 5-15. Keyframe Distort Popup

To edit a keyframe you must have the Keyframe Timeline called up. Then you press on a keyframe matchstick and it becomes highlighted and calls up the Keyframe Distort Popup. When you edit a keyframe, it appears as a wire-frame on the Canvas, as when using Paste Distort in the Paint Environment. The Keyframe Distort Popup is called up, which is almost identical to the Distort Popup in the Paint Environment, see page 4-136. In addition, a set of buttons appears at the right end of the Keyframe Timeline containing the Keyframe Attribute Buttons.

When you save an animation on disk, the actors and the actors' keyframes are saved as part of the animation.

To create and edit keyframes:

- **Press on the keyframe matchstick you want to edit**. The matchstick becomes highlighted. The bounding rectangle of the actor's image file appears on the Canvas. The Keyframe Distort Popup appears (similar to the Distort Popup in the Paint Environment).

- **Use the functions on the Keyframe Distort Popup to modify the actor's bounding rectangle on the Canvas.**

- **Press the OK button in the Keyframe Distort Popup to remove the popup and confirm the modifications you've made.**

Keyframe Attribute Buttons

Figure 5-16. Keyframe Attribute Buttons

At the right of the Keyframe Timeline are a group of functions controlling the keyframe's attributes. The Keyframe Time Window and the Auto Smooth Button. are here. This area also contains the Next and Prev Buttons, used to move from keyframe to keyframe while you are editing. Also here are several mode buttons which are either on (highlighted) or off, including Alpha, Warp, Under, Rotate, Scale, and Slant. A Preview Button is provided to preview the current keyframe, as well as an Alpha Slider to set the transparency level of the keyframe.

Keyframe Time Window

The Keyframe Time Window displays the current keyframe's time-code or frame number. You can press in the window to type in a new number, and the keyframe will move to the new time setting.

Auto Smooth Button

The Auto Smooth Button is on by default, meaning that Liberty automatically smooths out, or averages, animation curve points while you are editing the keyframes. In some cases this is not desirable - you want to manually move curve points without automatic smoothing being applied. In such a case, press the Auto Smooth Button to turn it off.

Next Button

In the Keyframe Distort Popup, you can press the Next Button to move to the next keyframe in the actor. Press the Copy Prefix first, then the Next Button, to copy all the attributes (excluding X, Y, Z position) of the current keyframe into the next keyframe.

Prev Button

In the Keyframe Distort Popup, you can press the Prev Button to move to the previous keyframe in the actor. Press the Copy Prefix first, then the Prev Button, to copy all the attributes (excluding X, Y, Z position) of the current keyframe into the previous keyframe.

NOTE

When you copy keyframes with the Copy Prefix Button, all values are copied *except* position.

Keyframe Copy All

This is a feature that allows you to copy a keyframe's settings, *including its position*, to another keyframe. With a Keyframe Matchstick highlighted for editing, press the Add Prefix Button, then the Copy Prefix Button, then the Next or Prev Keyframe Button. This only works for two keyframes with curve points that are adjacent on the timeline. This is perhaps the easiest way to create a hold on existing keyframes.

Keyframe Alpha Slider Scale

Press and drag to change the transparency of the keyframe.

Alpha Attribute Button

When the Alpha Button is on, the transparency of the keyframe is controlled by the setting of the Keyframe Alpha Slider Scale just above the Alpha Button. When the Alpha Button is off, the keyframe's alpha is interpolated from the nearest-neighboring keyframes with the Alpha Button on.

You can use the Alpha attribute to perform dissolves between individual actors (unlike a Switcher actor dissolve, which dissolves between all layers above it and all layers below it). Set the alpha of the dissolving actors so that one actor starts with 100% opacity in its beginning keyframe and animates to 0% opacity. The other actor simultaneously animates its alpha in reverse.

Warp Attribute Button

When you modify the keyframe using Warp Corners Mode, this button is highlighted. If this button is off, the keyframe is interpolated from the previous keyframe to the next keyframe.

The Warp Button is highlighted by default for the first and last keyframes in a new actor, because there are no other keyframes to interpolate from or to. For keyframes that you add later, the Warp Button is off, but is high-lighted if you change the warp parameters.

Under Attribute Button

When the Under Button is on, the keyframe is displayed under all other actors in the animation. When the Under Button is off, the keyframe is displayed in its normal layer in the animation. If two actors have the under prefix on, the one in the higher layer will appear below the other.

Texture Attribute Button

When you modify the keyframe using Warp Corners Mode, this button is high-lighted. Texture points are used to separate the image corners from the warped corners, and are really only used in Motion Tracking.

If this button is off, the texture corner points of the keyframe are interpolated from the previous keyframe to the next keyframe, according to the relative time of the keyframe.

Rotate Attribute Button

When you change the rotation of the keyframe, the Rotate Attribute Button turns on. When the Rotate Attribute Button is on, the keyframe's X, Y, Z rotation is controlled by the rotation functions of the Keyframe Distort Popup. When it is off, the keyframe's rotation is interpolated from the nearest neighboring keyframes having the Rotate button on.

Scale Attribute Button

When you change the size of the keyframe, the Scale Attribute Button turns on. When the Scale Attribute Button is on, the keyframe's X, Y size is controlled by the scaling functions of the Keyframe Distort Popup. When it is off, the keyframe's scale is interpolated from the nearest neighboring keyframes having the Scale button on.

Slant Attribute Button

When you change the slant of the keyframe, the Slant Attribute Button turns on. When the Slant Attribute Button is on, the keyframe's slant is controlled by the slant functions of the Keyframe Distort Popup. When it is off, the keyframe's slant is interpolated from the nearest neighboring keyframes having the Slant button on.

Keyframe Distort Popup

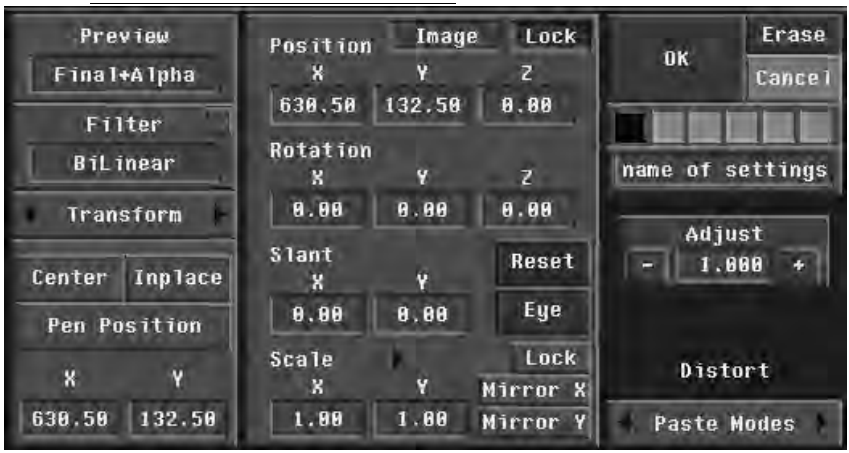

Figure 5-17. Keyframe Distort Popup

NOTE

This section similar to the section on Paste Distort in the Paint Environment, described on page 4-129.

The Keyframe Distort Popup is the same as the Paste Distort Popup in the Paint Environment. In addition to the standard paste functions, the Keyframe Distort Popup has tools for rotation in X, Y, and Z; scaling in X and Y; mirroring in X and Y; and slanting in X and Y.

Sub-Pixel Positioning

Figure 5-18. Keyframe Edit Menu

Keyframe Distort allows extra-precise positioning of elements being distorted and pasted. An image being pasted does not have to be deposited pixel-for-pixel on the image below it, but with a slight offset or overlap of the edges of the pixels it's being pasted on. Certain filter options (Adaptive) allow user-definition of how fine a "grid" to use to position the element. You can use this feature for animating very slow-moving elements.

Sub-pixel Button

Press the Sub-pixel Button in the Keyframe Edit Menu at the left of the Keyframe Timeline to turn it on/off. When turned on, sub-pixel positioning is enabled. When turned off, sub-pixel positioning is disabled.

When sub-pixel positioning is enabled, the image is pasted using the 3D distort even if the keyframe is not rotated, scaled or slanted.

Perspective Transform and Warp Corners

The Keyframe Distort Popup has two distinct modes that you interact with differently. Perspective Transform allows you to set up a full three-dimensional world in which to manipulate images. Warp Corners (which is part of the optional Motion Tracking software) allows you to perform arbitrary perspective mapping between the original image and a user-definable quadrilateral. In the middle of the left panel of the Distort Popup is a button labeled either Transform or Warp. Press this button to toggle back and forth between the two modes. The wireframe preview on the Canvas displays an XYZ axis when Perspective Transform is active and displays a cross when Warp Mode is active.

Perspective Transform

Perspective Transform displays a panel in the middle of the Distort Popup. This panel has five main modes - five different ways to manipulate the image to be pasted. These modes are Position, Rotation, Slant, Mirror and Scale. Each mode displays coordinate "handles" to press and drag the wireframe. Dragging each handle manipulates the image in a particular way. For instance, when Scale Mode is highlighted in the Distort Popup, dragging on a handle causes scaling. When Rotation Mode is highlighted in the Distort Popup, dragging on a handle causes rotation.

Position Button

You can always re-position the image, regardless of what other mode is active. To move the image manually, press on its axis (the XYZ icon) and drag it in the desired direction. If another mode (such as rotation) is active, it becomes temporarily disabled until you are finished dragging the image.

Press the Position button to enter Position Mode. Dragging the on-screen handles on the wireframe causes it to move in X or Y. Dragging the axis moves the wireframe in any direction.

The Position X and Y windows display the current coordinates of the image to be pasted. When the toggle button above the Y window displays the label "Image," the coordinates indicate the center of the image to be pasted. When that button displays the label "Axis," the coordinates indicate the XY position of the rotational axis of the image. It is possible to separate the axis from the image center using the Lock Button (see below).

Axis Lock Button (Global and Local)

Above the Z window is a Lock Button, which, when turned on, locks the axis to the image. This is Global Mode, because the locked axis and image move around inside a "world" defined by the Canvas. When the Lock Button is turned off, the axis is free of the image and can be moved completely away from it. This is Local Mode because the axis now defines local coordinates that the image refers to. If you turn on the Lock Button again, the image can, for instance, rotate around the new local position of the axis. It is generally better to perform Global moves first, then Local ones.

Image/Axis Button

Above the Y window is an Image/Axis button. When the "Lock: button is off, and the Image/Axis button is in "Image" mode, dragging the on-screen handles moves the axis independent of the axis. When the Image/Axis button is in "Axis" mode, dragging the on-screen handles moves the axis independent of the image. When the Lock button is on, dragging the on-screen handles positions both the image and axis together.

Rotation Button

Press on the word "Rotation" to enable Rotation Mode. Press and drag on the wireframe's handles to rotate the image in X, Y, or Z.

Slant Button

Press on the word "Slant" to enable Slant Mode. Press and drag on the wireframe's handles to slant the image in X or Y.

Scale Button

Press on the word "Scale" to enable Scale Mode. Press and drag on the wireframe's handles to scale the image in X and/or Y. Dragging on a corner handle scales the image in both X and Y. Dragging on a handle in the center of a side scales the image only in X or Y.

The scale of the image can be represented as a ratio (1.0 = 100%) or as a size in pixels. Tap on the small arrow to the right of the word "Scale" to toggle back and forth between the two modes.

Scale Lock Button

The Lock Button just above the Mirror Buttons is the Scale Lock Button. Press it to turn it on or off. When on, one edge of the image is held stationary while you drag the opposite edge and scale the image. If the image has already been rotated, you may have to unlock global positioning (the Axis Lock Button) to truly hold an edge in three-dimensional space.

Eye Button

The magenta Eye Button is used to customize the *look* of the perspective transformation. This is done by defining where the center of projection of the image is located. Press the Eye Button to call up the Eye Popup, which has three buttons: Image, Axis, and Fixed. In Image Mode the center of projection is centered on the middle of the image, regardless of where the axis may be. In Axis Mode, the center of projection is centered on the axis. In Fixed Mode, you choose any point to be the center of projection.

Any center of projection has by default a depth distance from the Canvas equal to the height of the Canvas. You can adjust this depth in z in all three Eye modes to create unique distortions. You can use a large negative depth ("behind" the Canvas) to achieve a parallel projection. You can set the depth to the height of each image to provide the same look for both large and small panning objects.

Fixed mode is useful for animations that need to use the same center of projection for objects on individual paths.

Experiment to see what kind of look you can achieve.

Reset Button

Press the red Reset Button to zero out the current settings. Reset has "soft" and "hard" modes. If a distort effect (Rotation, Scale, etc.) is active, pressing the Reset Button resets only the setting of that effect (soft reset). If no distort effects are active, pressing Reset resets all the settings in the Distort Popup, including changes made to the Eye settings.

Warp Corners

When the Transform/Warp Button label says "Transform", press it to change to Warp Corners mode. The current Perspective Transform wireframe is mapped to a Warp Corners wireframe. This allows you to do touch-up work on the three-dimensional distortion.

The Warp Corners Popup is much simpler than the Perspective Transform Popup. Warp generates the entire three-dimensional world simply by interpreting how you deform the wireframe. Dragging a corner of the wireframe allows you to position one corner at a time to distort (or warp) the wireframe. Dragging on the center cross allows you to move the entire wireframe.

NOTE

Warp Corners is part of the Motion Tracking software option, and requires that the appropriate licensing be activated.

Distort Filters

Distort has its own rendering filters, three pre-set and two user-definable. You should experiment to determine which ones are best for your applications. The Point Filter corresponds roughly to the coarse

filtering, the Bilinear Filter corresponds to medium filtering, and the Adaptive Filter to fine filtering. **Point Filter** is the default - fast, but a bit coarse.

About Filters

Two stages are required to properly reconstruct an image in 3-D perspective. The first stage is an interpolation (or reconstruction) stage, and the second is an anti-aliasing stage. If you want to understand filters better, the following will give you a quick explanation of how filters work. This will also help you understand the User-defined filters.

Interpolation

There are two methods used to interpolate (or reconstruct) the image from two-dimensional space into the specified three-dimensional space. The two methods are (1) nearest neighbour, and (2) linear.

Nearest neighbor chooses pixels based on the nearest sample pixel. This maintains sharpness when the image is enlarged and reduced. However, when you scale an element up from small to very large this method produces blocky results.

Linear interpolation chooses pixels based on the nearest four pixels. This offers better quality than nearest neighbor, with slightly greater cost in rendering time. However, smoothing is introduced into the image, so the image gets a bit soft.

Anti-aliasing

Any interpolation method introduces artifacts, which must be countered with anti-aliasing techniques. Liberty has two methods: point sampling and adaptive supersampling.

Point sampling is the simplest and quickest of the two. It takes the pixels straight from the interpolation stage with no extra calculations. For objects that are smoothly-varying (that is, continuous-tone, like a photographic image) this may be acceptable. For high-contrast images, this may not do the job.

Adaptive supersampling is more complex. It always produces the highest-quality render. This method looks at the image and finds all areas where there are high-contrast changes. When it finds them, it drops a subpixel grid on the image and approximates the pixel based on an average.

The point filter is the only filter that doesn't do subpixel positioning. The adaptive supersampling filter is very sophisticated. Both user-definable filters are adaptive supersampling filters.

User-defined Distort Filters

Press the corner button of the Filter Button to bring up the Adaptive Filter Popup, which allows you to define thresholds for the different channels (RGBA) in the image, as well as the resolution for each subpixel grid to be used. The thresholds use defaults that take into account the human eye's sensitivity to the green color channel, as well as stair-stepping artifacts that appear along the edges of the image. Press the Level button to specify the number of subpixels to be used in the render. A level of six means thirty-six subpixels will be used for each pixel in the original image. More is not necessarily better here, but more is definitely slower.

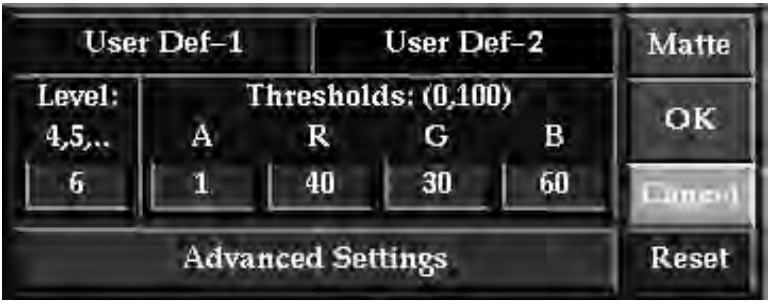

Figure 5-19. User-Defined Distort Filter Popup

Keyframe Distort Preview Modes

Keyframe Distort has three Preview Modes: Wireframe, Final, and Final Plus Alpha. Keyframe Distort always displays a wireframe bounding box, whatever the preview mode. In Final mode, a full-resolution preview of the image is displayed in the bounding box. In Final plus Alpha mode, the preview takes the alpha (transparency) of the image into account as well. You manipulate the wireframe box in real time on the Canvas.

Change Mode Button

The Change Mode Button toggles through the modes of the current paste operation. The arrow keys increment and decrement the co-ordinates of the current paste operation.

Keypad Controls for Paste Functions

You can use the keypad at the right of the keyboard to manipulate the paste functions, whether in manual or popup mode. Refer to Table 5-1.

NOTE: The Num Lock must be off for Keypad Control to function.

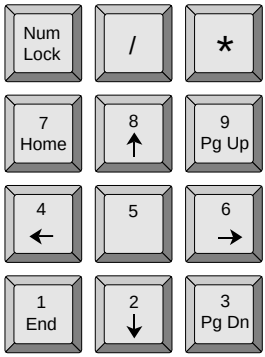

Figure 5-20. Numeric Keypad

Table 5-1: Numeric Keypad Keys/Functions

Key	Function
/	Turns off final preview of image
*	Turns on final preview of image
7/Home	Decreases Z position, increases Z rotation, decreases X, Y scale
8/↑	Increases Y position, increases X rotation, increases Y slant, increases Y scale
9/page up	Increases Z position, decreases Y rotation, increases X, Y scale
4/←	Decreases X position, increases Y rotation, decreases X slant, decreases X scale
5	Reset
6/→	Increases X position, decreases Y rotation, increases X slant, increases X scale
1/END	In place
2/↓	Decreases Y position, decreases X rotation, decreases Y slant, decreases Y scale.
3/page dn	Center

Realtime Paste/Distort Preview on Some Platforms

On platforms that support realtime performance, previews of Paste Distort/Warp update smoothly and continuously as the Paste bounding box is changed (using the Paste Popup, the pen/mouse controls on the Canvas, or keyboard controls). On slower platforms Final+alpha previews are done in software, with the previews only being updated when the controls are released (for example, when the pen is released from the Canvas controls).

In some cases, even on platforms capable of realtime performance, in cases of large images or when multiple images are being distorted/warped in Layers, some previews will be done in software (with the same interactivity as on slower hardware platforms).

Colored Dots on Matchsticks

When you change an attribute in a keyframe, a colored dot appears on its matchstick in the Keyframe Timeline. At a glance you can get a rough idea of what kinds of transformations a series of keyframes is going through. The color codes for the colored dots are as follows, starting at the top of the matchstick and moving down:

- **Light green - transparency**
- **Red - rotation**
- **Yellow - size (scaling)**
- **Purple - slant**
- **Light blue - under**

5.6 Speed Curve

The Speed Curves in the bottom half of the Keyframe Timeline allow you to vary the speed and acceleration of keyframe attributes as well as progress of the actor's image file along the curve path. Each Speed Curve is a graphic interface for varying speed and acceleration. Each keyframe attribute, such as rotation or transparency, or a combination of attributes, can be controlled by a separate Speed Curve.

A Speed Curve can only redistribute the speed between two keyframes; it cannot actually change the speed of the actor. The Duration of the Actor remains the same, and it still must travel through its path and keyframeable attributes in the given time.

A Speed Curve can be set to control :

- **Path (spatial position)**
- **Alpha**
- **Rotation**

- **Reference Point (center of rotation)**
- **Scale**
- **Slant**
- **Warp (Warp Corner Points)**
- **Effects (Mask and Write-on Actor keyframe sliders)**

You choose what attribute the Speed Curve controls by pressing on one of the colored buttons along the bottom of the Keyframe Timeline.

To choose one of the Speed Curve Buttons:

- Press on the desired Speed Curve Button. It becomes highlighted.

The default shape of the Speed Curve is a flat line. This default gives a constant speed with no acceleration. By pressing and dragging the **Speed Nails** (the little red points at either end of the Speed Curve) you can alter acceleration between the keyframes. A Speed Nail is automatically added for every keyframe. If you add more Speed Nails to the Speed Curve, you can press and drag them to create ever more complex acceleration and speed variables.

A downward slope from left to right applies a deceleration. An upward slope from left to right applies an acceleration.

Figure 5-21. Keyframe Timeline

Speed Nails

Speed Nails are the red control points on the Speed Curve. You can add as many Speed Nails as you like to the Speed Curve. You can press and drag the Speed Nails up and down, changing the slant of the top of the Speed Curve, thereby changing the relative acceleration/speed of the actor on its curve path.

Boundary Speed Nails

There is a separate speed curve segment for each neighboring pair of keyframes. Each such speed curve segment by default has two speed nails, called Boundary Speed Nails, located at the same timeline positions as the keyframes themselves. The Boundary Speed Nails cannot be deleted or moved away from the ends of the corresponding speed curve segment. Boundary Speed Nails can be moved vertically only. The two Boundary Speed Nails define the beginning and end speed of the Speed Curve segments path or attributes.

Moving the Speed Nails

To move a Speed Nail, thus changing the speed/ acceleration of the actor at that point, press on the Speed Nail you want to move and, holding the pen down, drag the nail to its desired position. The Speed Curve changes accordingly.

Speed Nail Tangents

Each Speed Nail has two tangents, represented by tiny green dots on either side of the Speed Nail. Boundary Speed Nails have only one tangent. Pressing and dragging a tangent changes the way the Speed Curve approaches or leaves its Speed Nail (just like tangents in the Curve Points functions).

Speed Curve Color Codes

Some of the Speed Curve Buttons have colored bars along the bottom of the button. These correspond to the colored tick marks on the blue Keyframe Matchsticks. A colored mark on a matchstick indicates that a parameter has been set for that matchstick at other than its default value. For example, a red tick mark on a matchstick indicates that the keyframe has a non-default (manually set) rotation. If the red tick mark is not present, then the rotation values for that keyframe are interpolated between the two closest keyframes with set rotations.

- **White dot - Path attribute**
- **Light green dot - Alpha attribute**
- **Red dots - Rotation & Translation attributes**
- **Yellow dot - Scale attribute**
- **Purple dot - Slant attribute**
- **Light blue dot - Under attribute**

NOTE

The Under Button has no Speed Curve (since Under is either on or off at each keyframe), but has a button to show the color of its representative tick mark - turquoise.

The Warp Speed Curve controls the interpolation of the warped corners when in Warped Corners Mode in the 3D Distort panel.

The Effects Speed Curve controls the interpolation of various actor's effects, such as shadow, emboss, Cinefusion, Shapes, Plug-ins, keying, brightness, ripple, and other Mask Actor effects.

The lower portion of the Keyframe Edit Menu (below the green OK button) contains buttons related to the Speed curve, including buttons to Add and Delete Speed Nails, and a 5-level elevator and controls for recalling and saving speed nails. It also contains in/out buttons for zooming the speed curve display in and out. These buttons are described in the following sections.

Speed Curve Elevator

The Speed Curve Elevator has 5 levels, each of which can store a Speed Curve. Beneath the elevator are three buttons: Save, Swap, and Recall. With one of the elevator levels highlighted, pressing Save, then pressing a speed curve on the timeline, causes the selected Speed Curve to be saved in that elevator level. Pressing Swap, then pressing a speed curve on the timeline, exchanges the selected Speed Curve with the Speed Curve in the current elevator level, if any. Pressing Recall, then pressing a speed curve on the timeline, recalls a Speed Curve from the highlighted elevator level, replacing the current Speed Curve in the Keyframe Timeline.

When you press on a Speed Curve Elevator level, a prompt appears in the Prompt Window. If the pressed level is empty, the prompts says, for example: "Level 2 is empty." If there is a Speed Curve in that level, the prompt might say: "Speed Curve with 2 Nails."

You can use the Copy Prefix to copy one level of the Speed Curve Elevator to another.

Add Speed Nail Button

To add a Speed Nail to the Speed Curve:

- **Press the Add Speed Nail Button.**

- **Press on the Speed Curve where you want the new Speed Nail to go.** The new Speed Nail appears where you press down and the shape of the Speed Curve changes accordingly.

Delete Speed Nail Button

To delete a Speed Nail from the Speed Curve:

- **Press on the Delete Speed Nail Button.**

- **Press on the Speed Nail you want to delete in the Speed Curve.** The Speed Nail you press on disappears and the Speed Curve changes accordingly.

Speed Curve Zoom Buttons (In and Out)

To magnify and unmagnify the Speed Curve, press the In and Out buttons at the bottom of the Keyframe Edit Menu. This gives you more precise control of the Speed Curve when moving the Speed Nails. 8 levels of magnification are permitted.

5.7 THE ACTOR POPUPS

This section details the functions of the Actor Popups appearing at the right of the Timeline. The type of Actor Popup depends on the actor type selected in the Timeline. The Actor Popups contain the tools for animating the different types of actors in the Timeline.

To display an Actor Popup, press on an actor in the Timeline to select it. The Actor Popup appears at the right of the Timeline, its type corresponding to the type of the selected actor.

Actor Type Button

At the bottom right of any Actor Popup is the Actor Type Button. It displays the name and color of the type of actor currently selected in the Timeline. Pressing the center of the colored window calls up the Actor Type Popup. Pressing either end of the colored window moves through the actor types.

You can use this button to change the type of the currently selected actor. This can be extremely useful. For example, if you have decided to use a single unchanging image instead of a filmstrip, you need only change the actor type to Cel, change it from Multiple to Single, and you can still retain all the keyframe and path information.

To change the type of the selected actor:

- **Press the Actor Type Button.** The Actor Type Popup appears.

- **Press the button for the actor type you want to change to.** The Actor Type Popup disappears and the selected actor in the Timeline changes color to its new type.

File Button

Press on the text window labeled "File" to bring up the File Popup. You can then specify a file for the actor.

Recall Cel Button

Press to Recall the actor's image file into the Canvas.

Edit Path Button

Press to call up the Curve Path Popup. You can use this popup to create or edit a curve path for the actor.

Edit Keyframe Button

Press to call up the Keyframe Timeline to edit the actor's keyframe attributes.

Actor Browse Window

This box shows a thumbnail sketch of the image-file associated with the currently selected actor.

5.7.1 Cel Actor Popup

The Cel Actor, color-coded green, is the most used of the actor types. There are two different kinds of Cel Actors: Single Cel Actors and Multiple Cel Actors.

The Cel Actor can contain a curve path for the image to follow during the animation, as well as keyframes for DVE-type rotation in x, y, and z. These keyframes also control attributes such as Transparency, Scale, Slant, and Under.

Single Cel Actor

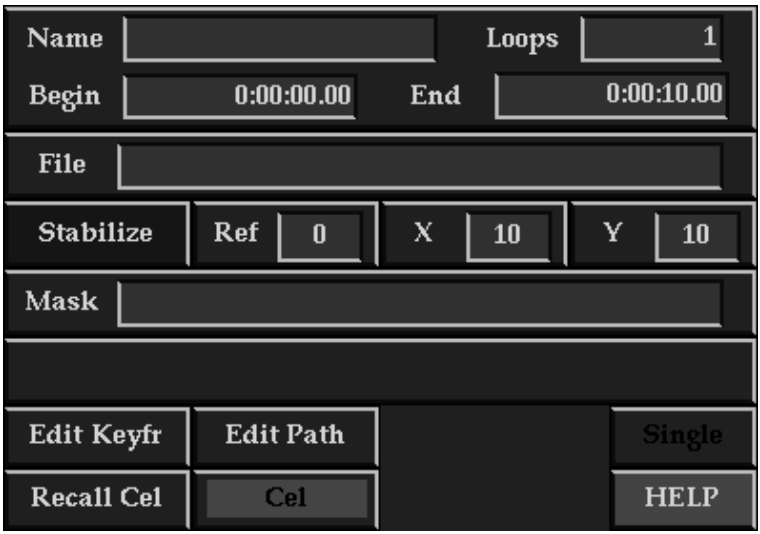

Figure 5-22. Cel Actor Popup (Single)

The Single Cel Actor is simple and easy to use. Use it when you want to animate one picture element stored as an image file on disk. A Single Cel Actor calls a single image file from disk and displays it in the animation.

To create a Single Cel Actor you need only specify its image file using the File Button. Then, if necessary, you can set up a path or keyframes.

Multiple Cel Actor

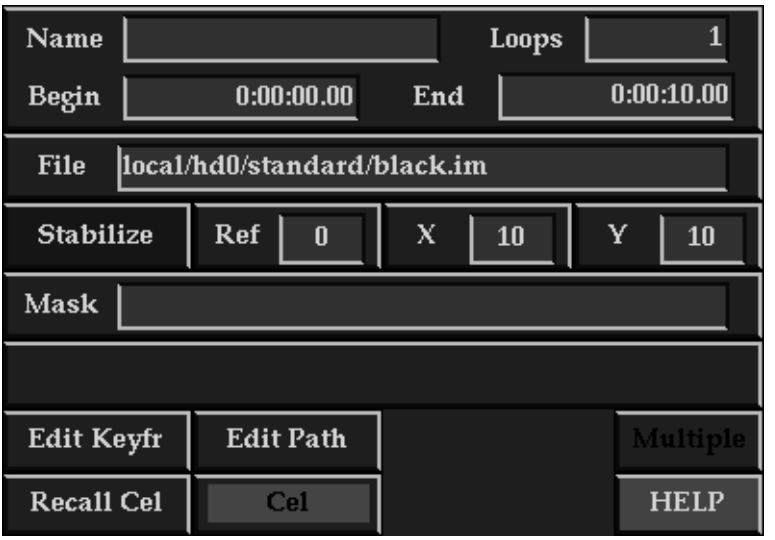

Figure 5-23. Cel Actor Popup (Multiple)

The Multiple Cel Actor is the second kind of Cel Actor. It looks the same as a Single Cel Actor except that in the Cel Actor Popup at the right is a button labeled Multiple (instead of Single, as you might expect!) . It uses a sequence of images instead of just one. It can use filmstrips (a sequence of numbered files; i.e. pic1, pic2, pic3) or unnumbered files, or a combination of the two. You specify the duration that each file is displayed on the screen, and whether the Actor holds on the last frame or cycles through the sequence again and again throughout the animation.

Inserting a Sequence into the Multiple Cel Actor

There are two different ways to create a sequence of files for the Multiple Cel Actor to follow. You can use the two different methods in tandem, but these step-by-step procedures take you all the way through creating a sequence in each one.

NOTE

The Multiple Cel Actor accomplishes the same effects as combining the Cycle and the Filmstrip actors, which are discussed next after this section.

In this discussion the term "filmstrip" refers to a sequence of files with the same filename and continuous numbers, like pic1, pic2, pic3, etc.

Using the Filmstrip File Menu

To create a sequence of files in Multiple using the Filmstrip File Menu (Figure 5-22):

- **Add a Cel Actor into the Timeline.**
- **Press on the word Single in the lower right corner of the Cel Actor Popup.** The Multiple Cel Popup appears.
- **Press on the File Window.** The File Popup appears.

Figure 5-24. Filmstrip File Menu *(in the Full-screen File Menu)*

- **Press on the button labeled "film" on the File Popup.** It is next to the "full" button used to access the Full-Screen File Menu. The Full-Screen File Menu appears, with a new popup at the bottom. This is the Filmstrip File Menu. The Insert Mode Button should be on.

- **Make sure Filmstrip Sort Mode is on.** If it isn't, you can turn it on by pressing the Sort Button and then turning on the Filmstrip Button.

- **Press on a browse image of a single file or a filmstrip in the full-screen file menu.** The filename turns blue.

- **Press in the empty strip in the Filmstrip File Menu.** A browse image of the file appears in the Multiple Cel File Popup. The original (in the Full-Screen File Menu) does not disappear.

- **Repeat Step 6 and 7 until you have several browse images in the Filmstrip File Menu.** Liberty reads the sequence from left to right. Use the arrow buttons on the right of the popup to scroll right, and the arrow buttons on the left to scroll left. If, instead of pressing on an empty space in the popup, you press on a browse image already in the popup, the new image is inserted in front of the image you press on.

- **Now you may edit the sequence you have created.** To Replace files in the sequence, press the Replace Mode Button to turn it on. When Replace Mode is on, you must press on a browse image already in the sequence, and it is replaced by the new image. To remove files from the sequence, press on the Delete Mode Button to turn it on. When Delete Mode is on, pressing on a file in the sequence removes it from the Filmstrip File Menu.

- **When you are finished, press the OK Button at the top of the Full-Screen File Menu.** The Full-Screen File Popup disappears.

The Filmstrip File Menu is also discussed on page 5-124 .

Figure 5-25. Cel Actor Popup (Multiple)

As mentioned previously, a multiple cel actor contains one or more elements (steps); each of which is an image file or numbered sequence of image files (filmstrip).

In the Multiple popup, at the right of the Timeline, the File Window displays the filename of one of the elements in the sequence. The Num Button displays the number of this element. The second number in the Num Button window is the number of total elements in the sequence (filmstrips are counted as one element, though they include many sequentially numbered files).

To create a sequence of files in Multiple using the Num Button and the File Button:

- 11. **Add a Cel Actor into the Timeline.**

- 12. **Press on the word Single in the lower right corner of the Cel Actor Popup.** The Multiple Actor Popup appears.

- 13. **Press in the window of the File Button.** The File Popup appears.

- 4. **Select a file from the File Popup by pressing on or typing its filename.** The File Popup disappears and the filename appears in the File Button. The chosen image file is assigned to step 1 of the cycle.

- 14. **Press the Insert Button to increase by one the displayed number in the Number Button, for example, "2 of 2."**

- 15. **Press the File Button and select from the File Popup the next image file to be used.** The File Popup disappears and the filename appears in the File Button. The chosen image file is assigned to step 2 of the cycle.

Repeat steps 5 and 6 until you have entered all the desired image files.

Pressing the Recall Cel Button recalls from disk the image file of the step currently displayed in the Num Button.

To change the image file of one of the steps of the cycle:

- **Repeatedly press the top/bottom half of the Num label to display the step whose image file you want to change,** for example, 3 of 10. You can also press directly on the number window and type in a new number.

- **Press the window in the File Button.** The File Popup appears.

- **Select a picture file from the File Popup by pressing on or typing its filename.** The filename appears in the File Button. This image (or filmstrip) is now assigned to the current step of the cycle.

Multiple Cel File Button

Displays the current step (image file or filmstrip) in the cycle.

Multiple Cel In and Out Number Windows

The In and Out Buttons treat a step in the cycle as a sequence of numbered files. For the filmstrips (sequentially numbered files), these designate the numbers that the filmstrip starts and ends with. The In number is the number of the first file in the filmstrip, and the Out number is the number after the last file in the filmstrip. Using these numbers you can designate a section of the filmstrip, instead of beginning at the very beginning and ending at the very end (which is the default). If the file has a number in it, but is only a single file, then the In number should be the number of the file, and the Out number should be one more than that.

Multiple Cel Num Button

Displays the number of the current step in the cycle and the number of total steps (files or filmstrips) in the sequence. A filmstrip is displayed as one step in the sequence, even though it may contain many files. The current file number designates the current step (file or filmstrip), which is displayed in the Actor Popup Browse Window, which will be recalled when you press Recall Cel, and whose file-name is displayed in the File Button.

The current step number can be incremented by pressing on the top half of the label, or decremented by pressing in the bottom half of the label.

Multiple Cel Insert Button

Press to insert a step into the sequence, increasing the total number of steps by one. Inserts after the current number.

Multiple Cel Delete Button

Press to delete the current step . The total number of steps decreases by one.

Multiple Cel Duplicate Button (Dup)

This button displays the number of fields to repeat each step of the sequence. This means that each image in the cycle is recorded for that number of consecutive fields (not frames!) before going to the next image in the sequence. The default is 2 fields (1 frame) per step. You can use odd or even numbers of fields.

To change the number of fields recorded for each step of the sequence, press directly on the **Dups** Window and type in a new number.

Multiple Cel Swing Button

Press to turn on/off. If turned on, the sequence plays to the end, and then plays in reverse to the beginning. If the Swing Button is on, a Multiple Cel Actor would take twice as long to complete a cycle, once forward and once backward.

Multiple Cel Once Button

Press to turn on/off. If turned on, the sequence plays once through, then holds on the last step, regardless of the duration of the actor.

If neither the Multiple Cel Swing Button nor the Multiple Cel Once Button are on, then the sequence will play as many times as the duration of the actor allows.

Rotation and Scaling of Actors Larger Than the Screen

You can include actors created at a higher resolution than the display screen. This means that they are larger than the screen you are rendering animation in. These larger actors include Cel Actors, Mask Actors, and Switcher Actors. A Temp or Mask Buffer large enough to hold the larger file is temporarily allocated to do this. You'll need sufficient RAM to support this.

5.7.2 Motion Stabilization

Motion Stabilization is part of the Motion Tracking software option. If this option has not been installed, the Stabilize Button will be grayed out.

Motion Stabilization allows the user to automatically correct for unwanted positional movement in a sequence of image frames. Before stabilizing a

sequence of frames, the user must choose a 'reference frame' from the sequence, along with a small rectangle of pixels in it that should remain stable throughout the sequence. Stabilization works by searching for this rectangle of pixels in each frame in the sequence. Once the pixels are located, the frame is pasted so that the pixels' spatial position is the same as in the reference frame. This corrects for unwanted positional motion in the sequence.

Stabilize Button

Press the Stabilize Button to turn Motion Stabilization on or off. When the Stabilize Button is turned on, it activates several buttons associated with it. The details of Motion Stabilization for a sequence of frames can be found on page 5-220.

5.7.3 Cycle Actor Popup

The Cycle actor is like a Multiple Cel actor except that it doesn't use filmstrips very easily. They can still be added into a sequence in the Multiple Cel File Popup, but there are no In and Out Buttons to control them with. If a sequence of files has no filmstrips in it, then using a Cycle Actor instead of a Cel Actor is useful, because on the Timeline you can identify a Cycle Actor by its color, while Single and Multiple Cel Actors look the same.

Like most other actor types, the Cycle Actor can contain a curve path for the series of images to follow during the animation, as well as keyframes for DVE-type rotation in x, y, and z. These keyframes also control attributes such as Transparency, Scale, Slant, Mirror, and Under.

Use the **Edit Path Button** to create a curve path for the file to follow (see page 5-60). Use the **Edit Key-frame Button** to create and edit the actor's key-frames. Use the Preview (page 5-223) or Storyboard functions to preview the animation you've created.

Figure 5-26. Cycle Actor Popup

5.7.4 Filmstrip Actor Popup

The Filmstrip actor is similar to the Multiple Cel Actor, except that it must use a sequence of numbered files. The Filmstrip Actor can also grab its images from a recording device (such as a DDR or VTR) instead of from the hard disk. The Filmstrip Actor only goes forward through its files, and there is no Filmstrip Swing Button.

The Filmstrip Actor can contain a curve path for the series of images to follow during the animation, as well as keyframes for DVE-type rotation in x, y, and z. These keyframes also control attributes such as Transparency, Scale, Slant, Mirror, and Under.

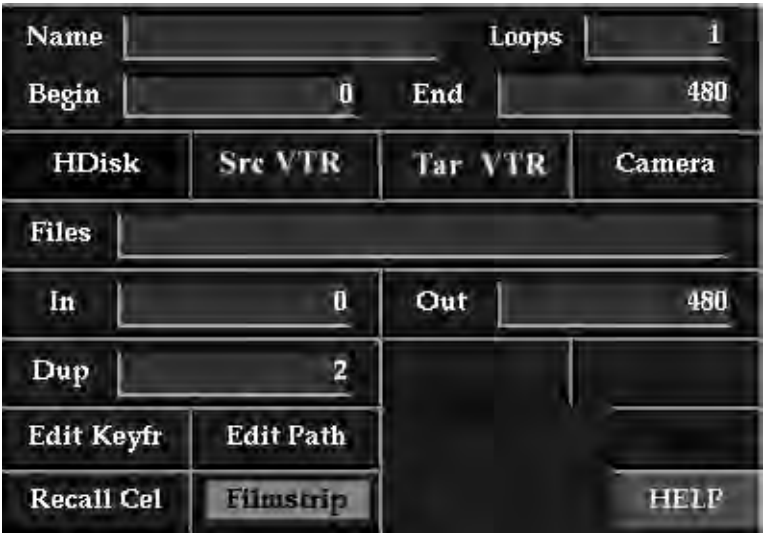

Figure 5-27. Filmstrip Actor Popup

To create a Filmstrip actor:

- **Add a Filmstrip actor to the Timeline.** The new actor is selected in the Timeline See adding actors, page 5-104.

- **Press the File Button.** The File Popup appears.

- **Select a picture file from the File Popup by pressing on or typing its filename.** The filename appears in the File Button. The filename must be one of a series of files with the same name and sequential numbers, such as pic1, pic2, pic3, etc. The filename may be any of the files in the sequence, not necessarily the first.

The current file displayed in the File Window of the Filmstrip Actor Popup can be recalled with the Recall Cel Button.

Filmstrip Source Buttons

Press one of these buttons to specify a source for the files of the Filmstrip Actor. Only one of these buttons can be on at a time.

Filmstrip Hdisk Button

When turned on, the images come from the hard disk, using the name entered in the File button.

Filmstrip Src VTR Button

Press to turn on. If turned on, images are grabbed from the VTR configured as the Src (source) VTR.

Filmstrip Tar VTR Button

Press to turn on. If turned on, images are grabbed from the VTR configured as the Tar (target) VTR.

Extract Button - De-interlacing

The extract functions allow you to de-interface video frames as they are input to Liberty in a Filmstrip Actor. Press the Extract Button to display the de-interlacing controls on the De-interfacing Popup.

De-interlacing Popup

Figure 5-28. De-interlacing Popup

This popup has two sets of identical controls, one for field 1 and one for field 2. The field 1 buttons control the render of the first field; the field 2 buttons control the render of the second field in the same way.

Use Even

When high-lighted, extracts and uses only the even field from the input source's current frame.

Use Odd

When high-lighted, extracts and uses only the odd field from the input source's current frame.

Off

When high-lighted, uses the entire current frame, as is, from the input source.

Reset

Resets both fields to Off.

Thus you can set the Filmstrip Actor to alternately grab even and odd fields from the input stream. This is useful when you are using the Filmstrip Actor to re-position or rotate the incoming video, because interlaced images often create unwanted artifacts in such cases. It is also useful when the incoming

images are of a different resolution than the Canvas, because the re-scaling that takes place often creates unwanted artifacts.

Hints About Field Order

Different devices have different field orderings. Most Digital Disk Recorders are odd field first, meaning than the even field was rendered roughly 1/60th of a second (for NTSC) after the odd field in time. The even field is contained in the even numbered scanlines while the odd field is in the odd numbered ones (in otherwords, the image is interlaced (not quite in the same meaning as GIF interlacing).

If you're pulling images off a DDR, you probably would extract with odd for Field 1 and even for Field 2. That would preserve the motion in each field correctly. If you did not, however, want the resulting images to be interlaced, you could use odd field for both Fields 1 and 2. That way, each from that got rendered would contain the corresponding odd field from the DDR in both rendered fields (the image would have lower resolution, since each scanline would be replicated twice). The image wouldn't be interlaced, however. For some applications, the interlacing is undesirable.

Filmstrip File Button

If the images come from hard disk, this button's window displays the filename.

Filmstrip In Button

This button displays the number of the first file to be used in the Filmstrip Actor or the frame number or timecode of the first image to be grabbed from a recording device.

To change the number, press in the window of the button and type in a new number. Or press the top part of the "In" label to increase the number by one; press the lower part of the "In" label to decrease the number by one.

Filmstrip Out Button

This button displays the number of the last file, plus one, to be used in the Filmstrip Actor. The Out number is the In number plus the duration; the duration is the Out number minus the In number.

To use a recording device as a source for the files of a Filmstrip actor:

- **Turn on the Timecode Button in the Playback Menu at the upper left of the Animation Environment.** You can optionally use Frame Mode (Timecode Button off) if using a disk recorder as the source device.

- **Press the Src VTR or Tar VTR Button to choose a configured device as the source device.**

- **Press in the window of the Filmstrip In Button and type the timecode number of the first file to be used.** You can separate numbers with spaces rather than colons. For example, typing 4 2 28 15 yields a timecode of 04:02:28:15.

The number in the window of the Out Button is set automatically, adding the Filmstrip Actor's duration to the In number. Entering a new number in the window of the Out Button automatically resets the number in the In Button (Out minus duration).

You can increment the In/Out numbers by pressing repeatedly on the top half of the In/Out labels. You can decrement the In/Out numbers by pressing on the lower half of the In/Out labels.

Filmstrip Speed Slider

Figure 5-29. Filmstrip Actor Popup

Press and drag the Filmstrip Speed Slider to give a fixed playback speed to the input stream. It allows you to specify a fractional number between -10 and +10 (the number can be, for example, 2.377564). This number is the number of input source frames per rendered frame. The default is 1, meaning one input source frame for every rendered frame. The entire input stream will be given this fixed playback speed. You can also press on the numerical window to type in a speed setting. The following are examples of speed values:

2 Renders the Filmstrip Actor twice as fast as normal (every other source frame is skipped).

0.5 Renders the Filmstrip Actor at half speed (every source frame is used for two rendered frames).

-1 Renders the Filmstrip Actor backwards at normal speed. For this to work, the in-point must be set to a timecode/frame number towards the middle or end of the source stream (the actor always starts at this point).

Dynamic Speed Control - Speed Keyframe Button

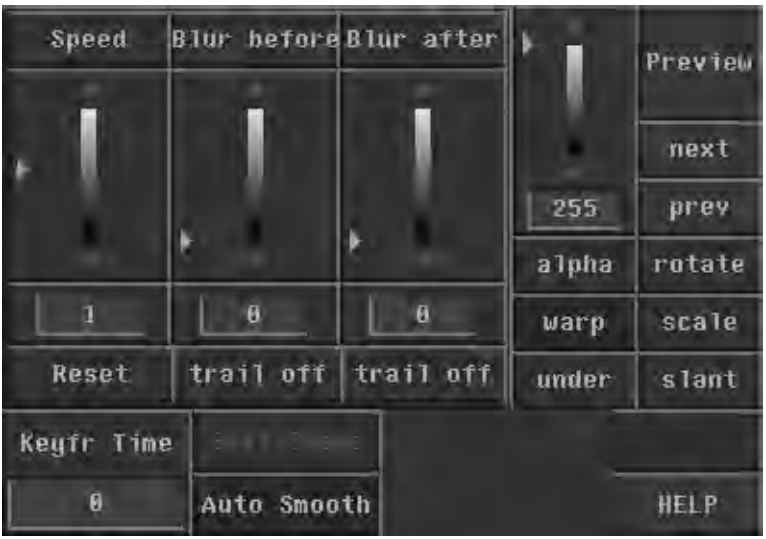

Figure 5-30. Filmstrip Keyframe Popup

Press on the Keyframe Button (inset in the Speed Slider) to high-light it. This turns off the Speed Slider's fixed setting and allows you to assign dynamic, keyframed settings to the playback speed. Now, when this button is high-lighted, when you press the Edit Keyframe Button and edit a keyframe, the popup displays a Speed Slider for each keyframe. Press and drag the slider to set a different

playback speed at each keyframe. Dynamic speed changes between keyframes are interpolated fractionally, frame-by-frame.

Motion Blur and Trail Off

As above, when the Speed Slider Keyframe Button is high-lighted, each keyframe's popup displays Motion Blur and Trail Off controls. The default setting is zero, or no motion blur.

Blur Before

Press and drag the Blur Before slider to set how many frames are to be blurred, or blended, with the current keyframe before the current keyframe.

Blur After

Press and drag the Blur After slider to set how many frames are to be blurred, or blended, with the current keyframe after the current keyframe.

Trail Off

Press either Trail Off Button to high-light it, causing the blended frames further away from the current keyframe to be progressively more transparent, giving a gradual "trailing-off" quality to the before or after motion blur.

5.7.5 Text Actor Popup

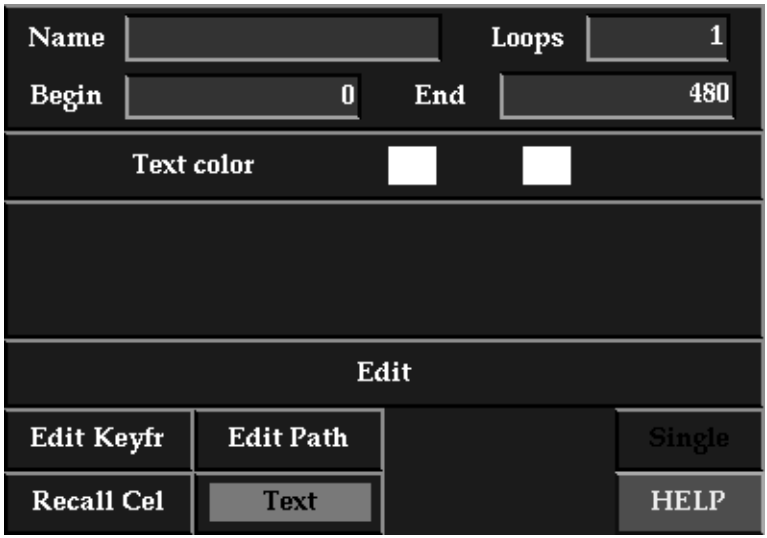

Figure 5-31. Text Actor Popup

The Text Actor is similar to the Cel Actor except that it animates a vector text file instead of an image file from the disk. Its main advantage is that the text file is re-rendered for each field or frame of the animation, so that even when it is scaled up it is displayed at full resolution. The Text Actor also can animate the color of the rendered text. The Text Actor can contain a curve path for the text to follow during the animation, as well as keyframes for DVE-type rotation in x, y, and z. These keyframes also control attributes such as Transparency, Scale, Slant, Mirror, and Under.

To create a Text actor:

- **Add a Text actor to the Timeline.** The new actor is selected in the Timeline. See adding actors, page 5-51.

- **Press the Edit Button in the Text Actor Popup at the right of the Timeline.** The Text Panel appears along with a wire-frame of the current text, if any, on the Canvas. The Text Panel called up by the Text actor is identical to the Text Panel in the Paint Environment, except that the Render Button is replaced by an OK Button.

- **Create or edit a text file using the Text Functions in the Text Panel.**

- **Press the OK Button in the Text Panel.** The Text Panel disappears. The text file you created or edited is now in the Text Actor. You can save the animation with the Text Actor to disk, and later when you recall it the data in the actor's text file is recalled as well.

Text Color Button

The Text Color Button allows you to choose two colors in which to display the animating text, one beginning the animation and one ending it, with a smooth dissolve between the two.

To animate the color of the Text actor:

- **Press the left color box in the Text Color Button.** The Color Palette (identical to the Palette in the Paint Environment) appears at the upper left of the Animation Environment.

- **Choose/modify a palette box for the beginning text color.**

- **Press again the left color box in the Text Color Button.** The Color Palette disappears. The beginning text color is now set.

- **Repeat steps 1 through 3 using the right Color Box in the Text Color Button.** The ending text color is now set.

5.7.6 Write-On Actor Popup

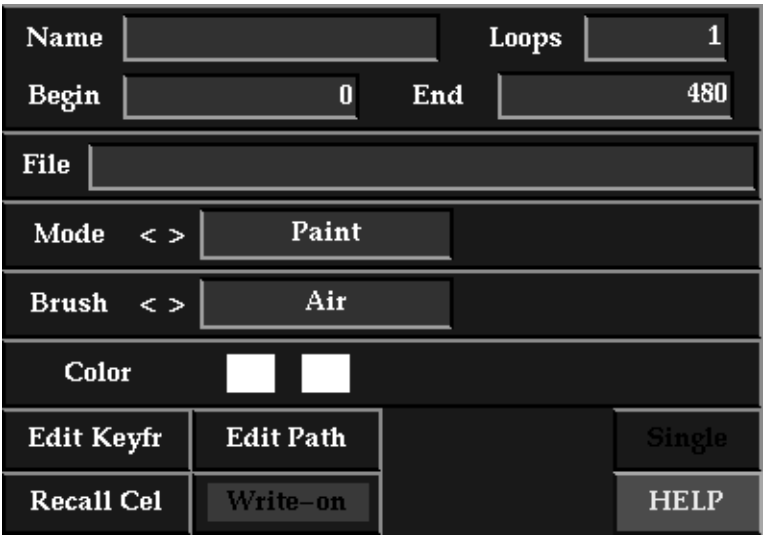

Figure 5-32. Write-On Actor Popup

The Write-on actor allows you to animate a paint brush along a curve path to create write-on animations. You can use any of the four Brush Modes, the same as in the Paint Environment. You can "nest" Write-on actors to create complex brush effects. You can create a Cycle actor to run along with a Write-on actor to create "burn-in" effects.

To create a Write-on Actor:

- **Add a Write-on Actor to the Timeline.** The new actor is selected in the Timeline. See adding actors, page 5-51.

- **Press the Edit Path Button and create a curve path for the write-on animation.**

- **In the Write-on Actor Popup, press on the arrows next to the Text Window in the Brush Mode Button to choose a brush mode (Prog, Solid, Air, Custom) or press on the Text Win-**

dow itself to call up a popup with all the brush modes. The Brush Mode Button you press displays in the Text Window.

- **Press on the arrows next to the Text Window in the Paint Mode button to choose a paint mode** *(see* ***Figure 5-34****)***, or press on the Text Window itself to call up a popup with all the brush modes.** The Paint Mode Button you press displays in the Text Window. If you choose Paste, Tint, Noise, Hue, Pick, or Reveal, you can give the Write-on a file to use in the File Window - this takes the place of the file in the Temp Buffer that would be normally used in these modes in the Paint Environment.

Write-on Color Button

The Write-on Color Button allows you to choose two colors for display of the write-on, one beginning the write-on and one ending it, with a smooth gradated ramp between the two.

To set the color of the Write-on actor:

- **Press the left color box in the Write-on Color Button.** The Color Palette (identical to the Palette in the Paint Environment) appears at the upper left of the Animation Environment.

- **Choose/modify a palette box for the beginning write-on color.**

- **Press again the left color box in the Write-on Color Button.** The Color Palette disappears. The beginning write-on color is now set.

- **Repeat steps 1 through 3 using the right Color Box in the Write-on Color Button.** The ending write-on color is now set.

Brush Mode Button

Figure 5-33. Brush Modes Popup

Allows you to use one of the four Brush Modes to make the write-on animation. The Brush Mode Button has a text window showing the current Brush mode. Press on the text window to bring up a popup with the four Brush modes to choose from. Only one can be chosen at a time. When one of the modes is chosen, the write-on animation uses the current brush in that mode. If you want to change one of the diagrammed Programmed Brushes, or a user-defined Custom Brush, you must go to the Paint Environment. You cannot have two different user-defined or programmed brushes in the same animation.

Write-on Paint Mode Button

Figure 5-34. Paint Modes Popup

The Paint Mode Button has a text window showing the current paint mode. Press on the text window to bring up a popup with all the available modes to choose from. Only one can be selected at a time. All

modes except Normal, Smear, Warp, Blur, Sharpen, Emboss, Burn, Dodge, Saturate, and De-saturate require an image in the File Button to work on. Smear, Warp, Blur, Sharpen, Emboss, Burn, Dodge, Saturate, and De-saturate modify the rendered result of the layers below the write-on actor, while Normal Mode just paints with the selected colors.

Write-on Actors have the following choice of Paint modes: Normal, Smear, Warp, Blur, Sharpen, Emboss, Burn, Dodge, Saturate, De-Saturate, Reveal, Tint, Hue-Tint, Paste, Pick, Noise-luminance, and Noise-color.

File Button

Press on the File Button on the Write-on Actor Popup to choose a source file for the modes that require it.

Write-On Actor Keyframe Popup

When the Write-on Edit Keyframe Button is activated, an additional write-on actor keyframe popup appears.

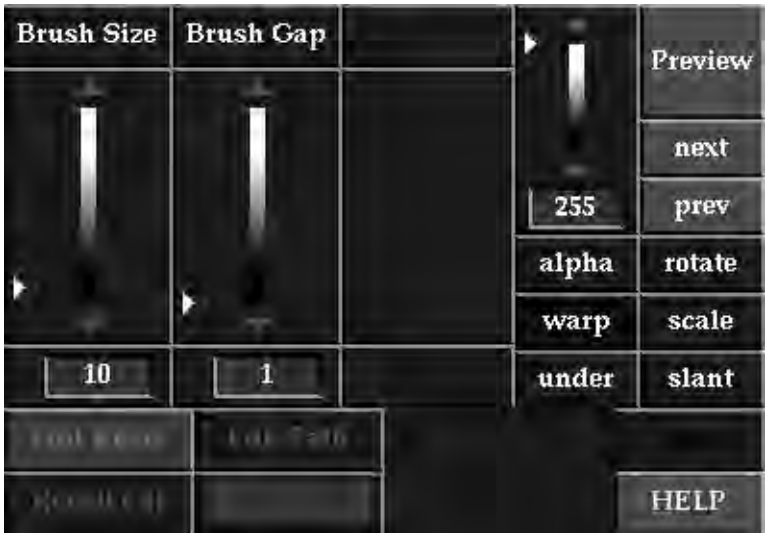

Figure 5-35. Write-on Actor Keyframe Popup

The Write-on Size Slider (The left slider)

Press and drag to set the size of the brush. The range is 1 to 127 pixels, the same as in the Paint Environment.

The Write-on Gap Slider (The right slider)

Press and drag to change the gap between brush "place-downs." The gap is expressed in percentage of the diameter of the brush. At 100 the brushes are placed edge-to-edge. At more than 100 there is a gap between brushes. At less than 100 the brushes overlap. Default is the minimum gap, 1.

Nesting Write-on Actors

After creating a Write-on actor, make copies of it and change the size and mode of the brushes, putting the smallest brush in the top-most Write-on actor. Thus all the curve paths of the actors are identical, but the different brushes can create "stacked" effects more complex than a single Write-on actor. You can create a Write-on shadow by slightly offsetting the curve of a copied Write-on actor and resetting its color and transparency appropriately.

"Burning-in" a Write-on Animation

Make a copy of a Write-on actor and change it to a Cycle actor (page 5-46). Go into the Paint Environment and create a series of image files - with, say, four or five steps - representing a sparkling or glowing effect. After saving these to disk, go back into Animation and assign them to the Cycle actor. The resulting animation will move the sparkle or glow cycle along the same curve path as the Write-on, giving the effect that the Write-on is "burning" itself in.

5.7.7 Morph Actor Popup

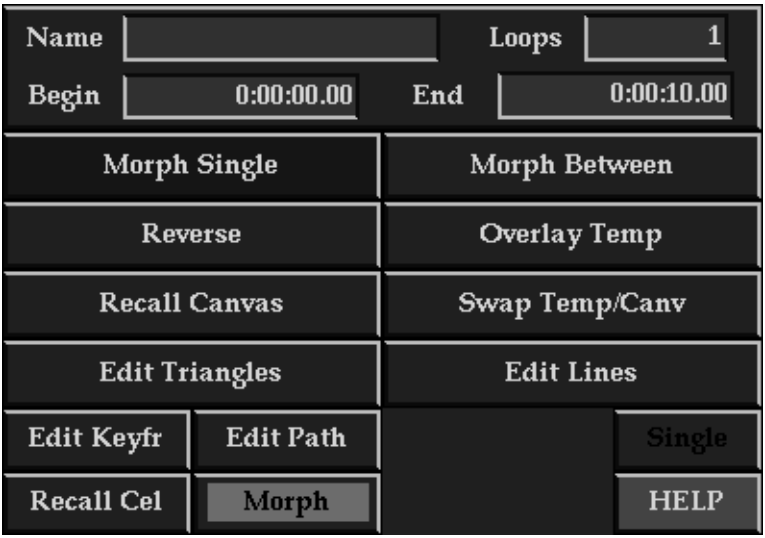

Figure 5-36. Morph Actor Popup

Use the Morph Actor Popup at the right of the Timeline to choose whether to morph a single image or between two images and to access the Triangle Morph and Line Morph Popups. Once you've edited a Morph Actor as Triangle Morph, you can't change it later to Line Morph (and vice-versa). You must add a new Morph Actor to the Timeline.

Morph Single Button

Press to turn on. When this mode is on, the morph is performed only on the image file of the actor below the Morph Actor. It is distorted instead of being morphed into something else.

Morph Between Button

Press to turn on. When this mode is on, the morph is performed between two images, starting with the actor below the Morph Actor on the Timeline and morphing to the actor above the Morph Actor.

Morph Reverse Button

Press to turn on/off. When on, the morph is performed in reverse. If Morph Between is on, the morph starts with the actor above the Morph Actor and morphs to the actor below the Morph Actor. If Morph Single is on, the distortion starts with the last keyframe and ends with the first one.

Morph Recall Canvas Button

Press to recall a file to the Canvas. The File Popup appears, and you press on or type a filename. The image file is recalled to the Canvas. Allows you to quickly to recall and look at files from the disk for possible inclusion in a morph.

Morph Swap Temp/Canv Button

Press to swap the Canvas and the Temp. The image on the Canvas goes to the Temp and the image from the Temp is recalled to the Canvas. You can use the Morph Recall Canvas Button (see above) to recall an image file to Canvas, swap it to the Temp, and then recall another image file to Canvas. This is a way to load two image files for a morph and quickly swap back and forth between them to compare them.

Morph Edit Triangles Button

Figure 5-37. Triangle Morph

Press to call up the Triangle Morph Popup. The popup is the same as the Triangle Morph Popup in the Paint Environment. A button-by-button description of the Triangle Morph Popup follows below.

Triangle Morph Add Points Button

Press to add control points to the Canvas. (You must specify a bounding box first. Press down once to set the first corner, and then without dragging, move the cursor to the diagonally opposite corner and press again.) Adding a point connects the new point to other points (or to corners of the bounding box), forming triangular sections, creating a grid that controls the morph. You can use the Move Button while adding points to reposition points you have just added. Unlike Line Morph, you cannot

add or delete points after you press the Lock Button. Press the Lock Button again or another Triangle Morph Popup button to terminate the add function.

Triangle Morph Delete Points Button

Press to delete control points from the Canvas. Then on the Canvas press on a point to delete it. The point disappears along with the lines connecting it to other points. You cannot delete points after Lock is pressed. Press the Lock Button again or another Triangle Morph Popup button to terminate the delete function.

Triangle Morph Move Points Button

Press to move control points on the Canvas. On the Canvas press on and drag a point. The point moves, along with the lines connecting it to other points. You are prevented from moving a point across a connecting line. You can move points in any keyframe of the morph at any time, even after pressing the Lock Button. Press the Lock Button again or another Triangle Morph Popup button to terminate the Move function.

Triangle Morph Color Button (corner of Move)

Press to switch the color of the line segments. Use this when it's difficult to see the line segments on the Canvas background. The default is red for the line segments which become yellow when they are selected. Press the Color Button to reverse this.

Triangle Morph Add Keyframe Button

To add a keyframe to the Morph Slider:

- **Move the yellow pointer to the place on the slider where you want to add a keyframe.**

- **Press the Add Keyframe Button.** A blue keyframe marker appears in the Morph Slider above the yellow pointer. After adding a keyframe, use the Move Button to move points on the Canvas to define it. You can move points in any keyframe of the morph at any time.

The number of keyframes you can have is limited by the space along the slider. If you try to add a keyframe too close to an existing keyframe, you are prompted: "Cannot be too close to another keyframe." Move the yellow pointer and try again.

Triangle Morph Copy Keyframe Button

To copy the control points from one keyframe to another:

- **In the slider, position the yellow pointer beneath the blue keyframe marker you want to copy from.**

- **Press the Copy Button.** You are prompted: "Please specify keyframe to copy to."
  If the yellow pointer is not beneath a keyframe, you are prompted: "Please specify keyframe to copy from." Move the yellow pointer under an existing blue keyframe marker and press the Copy Button again.

- **Press below another blue keyframe marker on the Triangle Morph Slider.** The data from the first keyframe is copied into the indicated keyframe.

NOTE

Do not press directly on the blue keyframe marker itself, but under it on the same line as the yellow pointer. A successful copy prompts: "Keyframe copied successfully." If you try to

press directly on a blue keyframe marker, you are prompted: "Cannot copy to source keyframe."

Triangle Morph Delete Keyframe Button

To delete a keyframe marker:

- Position the yellow pointer beneath the blue keyframe marker you want to delete.
- Press the Delete Keyframe Button. The blue keyframe marker disappears from the slider.

Triangle Morph Reset Button

Press twice quickly to reset the morph functions. All keyframes, including points, connecting lines, and the bounding box are deleted. You are prompted: "Restarted MORPH. Please specify bounding box."

To set the bounding box, press once to set the first corner. Then press again, setting the diagonally opposite corner (the same as Rectangle Mask). If the bounding box is set incorrectly, drag the corner points to new positions.

Triangle Morph Lock Button

Initially the morph is unlocked, meaning that you are editing the first keyframe, and no other keyframes exist. Once the first keyframe is complete, pressing lock creates the corresponding end keyframe, which you then edit to define the morph.

Press the Lock Button to lock control points after the first keyframe is set. The beginning and ending blue keyframe markers appear on the Triangle Morph Slider, with the yellow pointer at the last keyframe. Now you can use the Move Button to modify the

points on the Canvas to define the final keyframe. You can also add more keyframes. After pressing Lock you can't add or delete points, only move them. You only have to press Lock once - after you've finished setting the first keyframe points.

Triangle Morph OK Button

Press to render one frame of the morph, as determined by the position of the pointer in the Triangle Morph Slider. Renders on top of the existing picture on the Canvas, or under it, if the Under Prefix is on.

Press the Erase OK Button to erase the Canvas before rendering.

Triangle Morph Keyframe Slider

You can move any keyframe in the slider by pressing on the blue keyframe marker and dragging it to a new position. This changes the keyframe's place in the Timeline. No keyframes appear in the slider until you press the Lock Button. When you press on the slider, the percent completion of the morph at that point is displayed in the Prompt Window. When you press on one of the blue keyframe markers, the number of that keyframe marker is displayed in the Prompt Window.

Morph Edit Lines Button

Figure 5-38. Line Morph Popup

Press to call up the Line Morph Popup. The popup is the same as the Line Morph Popup in the Paint Environment. A button-by-button description of the Line Morph Popup follows below.

Line Morph Add Button

Press to add line segments. Press on the Canvas once to place the beginning of a line segment, then lift and press a second time to place the end of the line segment. Add as many line segments as you want. The "arrowhead" at the front end of the line segment is a reminder later as to whether the direction of the line segment has been changed.

While adding line segments you can use the Move Button (see below) to reposition line segments you have just added. Unlike Triangle Morph, you can add or delete line segments after you press the Lock Button. Press the Lock Button again or press another Line Morph button to terminate the Add function.

Line Morph Delete Button

Press to delete line segments from the Canvas. On the Canvas press on a line segment to delete it. The line segment disappears. Delete as many segments as you want before terminating the function by pressing the Delete Button again or any other Line Morph Popup button.

You can select more than one line segment and press the Delete Button to delete them all at once. However, it's no faster than deleting them one by one.

Line Morph Move Button

Press to move line segments. On the Canvas, press in the middle of a line segment to drag it to a new position, or press just beyond an endpoint to drag just the endpoint (stretching or rotating the line segment). You can move line segments in any keyframe at any time, even after pressing the Lock Button. Press the Move Button again or another Line Morph Popup button to terminate the Move function.

Line Morph Color Button

Press to switch the color of the line segments. Use this when it's difficult to see the line segments on the Canvas background. The default is red for the line segments which become yellow when they are selected. Press the Color Button to reverse this.

Line Morph Tune Button

Press to call up the Tune Popup. In general, the further away a line segment is from a pixel, the less effect it has on that pixel. Tune allows you to adjust three settings with sliders: Blend, Distance, and Length. The best way to understand these settings is to experiment (It's sometimes difficult to predict what the exact effect will be for a certain combination of settings).

The Blend Slider

The Blend Slider controls the smoothness of the morph, or the amount of blending between line segments.

The Distance Slider

The Distance Slider controls how the effect of a line segment diminishes with distance.

The Length Slider

The Length Slider, if non-zero, makes longer line segments have a greater effect on the morph.

Press the Cancel Button on the Tune Popup to cancel any changes you've made to the Tune settings. Press the Reset Button to reset the Tune settings to their defaults.

Line Morph Select Button

Press to select line segments. Press near a line segment to select it. The selected line segments change color. Pressing a selected segment un-selects it. Press the Move Button to move all the segments simultaneously.

You can also select more than one line segment and press the delete Button to delete them all at once. However, it's really no faster than deleting them one by one.

Line Morph Add Keyframe Button

Press to add a keyframe into the keyframe slider. A blue keyframe marker appears in the Morph Slider wherever the yellow pointer is when you press Add Keyframe. Use the Move Button to move line segments on the Canvas to define the new keyframe. You can move line segments in any keyframe of the morph at any time.

The number of keyframes you can have is limited by the space along the slider. If you try to add a keyframe too close to an existing keyframe, you are prompted: "Cannot be too close to another keyframe."

Line Morph Copy Keyframe Button

To copy the line segment data from one keyframe to another:

- **Position the yellow pointer in the Line Morph Slider beneath the keyframe you want to copy from.**

- **Press the Copy Button.** You are prompted: "Please specify keyframe to copy to." If the yellow pointer is not beneath a keyframe, you are prompted: "Please specify keyframe to copy from." Move the yellow pointer under an existing blue keyframe marker and press the Copy Button again.

- **Press below another blue keyframe marker on the Line Morph Slider.** The data from the first keyframe is copied into the indicated keyframe.

NOTE

Do not press directly on the blue keyframe marker itself, but under it on the same line as the yellow pointer. A successful copy prompts: "Keyframe copied successfully." If you press directly on a blue keyframe marker, you are prompted: "Cannot copy to source keyframe."

Line Morph Delete Keyframe Button

To delete a keyframe:

- **In the slider, position the yellow pointer beneath the blue keyframe marker you want to delete.**

- **Press to delete the keyframe at the current position of the yellow pointer on the Line Morph Slider.** The blue keyframe marker disappears from the slider.

Line Morph Reset Button

Press twice quickly to reset the morph functions. All keyframes, including line segments are deleted. You are prompted: "Restarted LMORPH. Please enter line segments."

Line Morph Lock Button

Initially the morph is unlocked, meaning that you are editing the first keyframe and no other keyframes exist. Once the first keyframe is complete, pressing Lock creates the corresponding end keyframe, which you then edit to define the morph.

After pressing Lock you can still add, delete, or move line segments. You only have to press Lock once - when you've set the first keyframe points.

Line Morph Test Button

Press the Test button to go into Test Mode. The line segments appear on the screen, their position determined by the yellow pointer in the slider. When you press on the Canvas, the pixel you press jumps to its original source position and shows as a dot in the alternate color. The distance of the displayed dot from the pressed pixel shows you the magnitude and direction of the distortion of that pixel. Press the Test Button again or another Line Morph button to terminate Test Mode.

Line Morph OK Button

Press to render the morphed distortion, as determined by the position of the pointer in the Line Morph Slider. Renders on top of the existing picture on the Canvas, or under it if the Under Prefix is on. The corner button renders at one-fourth resolution.

Press the Erase OK Button to erase the Canvas before rendering. The corner button renders at one-fourth resolution.

Line Morph Keyframe Slider

This slider is a timeline of the morph from beginning to end. You can move any keyframe in the slider by pressing on the blue keyframe marker and dragging it to a new position. No keyframes appear in the slider until you press the Lock Button. When you press on the slider, the percent completion of the morph at that point is displayed in the Prompt Window. When you press on one of the blue keyframe markers, the number of that keyframe marker is displayed in the Prompt Window.

Tracking Features in Line Morph

You can place line segments on features you want to track through a morph. For instance if you are morphing one face to another face and want the eyes, nose, and mouth to track through to the second face: Place a line segment on each feature in your starting keyframe; then when you set your final keyframe, move the line segments to follow the corresponding features in the second face.

NOTE

The Morph Actor need not be the same length as the actors to be morphed. The Morph Actor acts on whatever is above or below it at the current time. However, it must have something to act on.

5.7.8 Macro Actor Popup

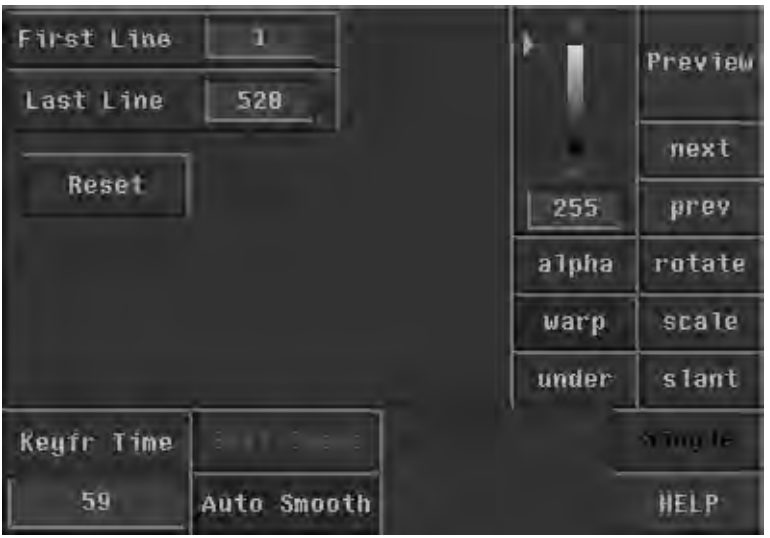

Figure 5-39. Macro Actor Popup

The Macro Actor allows a Macro (history file) to be played back as a layer in an animation. Thus you can integrate many powerful Paint Environment functions into any animation. A Macro can play back in its entirety for each frame of the animation (useful for rotoscope-type processes, including Mask Panel and Tools Panel functions). Or, a Macro can play back incrementally; i.e., more and more of it renders each frame (useful for write-on Macros containing hand-painted brush strokes, using Pressure Paint, for example).

When the Macro renders as an animation layer, Liberty switches momentarily to the Paint Environment, then back to the Animation Environment for the next frame.

To create a Macro Actor that plays through at each frame:

- **Create a Macro in the Paint Environment.** See page 4-394.
- In the Animation Environment, clear the Timeline, if necessary.
- Add a Macro Actor to the Timeline.
- Press the File Window at the right of the Timeline and assign the Macro you just made. This creates a Macro Actor that plays the entire macro at every frame.
- Render a Storyboard of the animation and play it back.

To create a Macro Actor that plays incrementally:

- Repeat steps 1 through 4 above.

- Press the Edit Keyframe Button at the right of the Timeline. The Keyframe Popup appears.

- **Press on the first Keyframe to edit it.** The Macro Keyframe Popup appears.

- **Press in the End Line Window in the Macro Keyframe Popup, then type in "1."** The Macro plays one line of the Macro per frame.

- Render a Storyboard of the animation and play it back.

Macro Actor Keyframe - First & Last Line Numbers

These windows set which lines of the Macro are to be rendered at the keyframe. They are set by default to the first and last lines of the Macro assigned to the actor. When left at their default settings, the entire macro plays at each frame (the first example above). Changing these numbers allows you to render a keyframable portion of the Macro at each frame. The most common use of this is to change the Last Line of the first keyframe to 1. This incrementally renders more and more of the Macro each frame. This capability is very powerful, but is also easy to misuse.

NOTE

The two examples given above - one, playing the Macro in its entirety at each frame, and, two, incrementally increasing the Macro with each frame - are the two primary way to use the Macro Actor. However, other variations are possible. Experiment with different settings for the First and Last Line numbers - they behave very differently, depending on the Macro being used. Use the two

examples given above, and introduce variations in the numbers to see how they behave.

The First Line Window

The First Line Window specifies which line in the Macro file is the first line to be executed at the key-frame. In between keyframes, the First Line number is interpolated. The First Line and the Last Line numbers are interpolated independently of each other.

Last Line Window

The Last Line Window specifies which line in the Macro file is the last line to be executed at the key-frame. In between keyframes, the Last Line number is interpolated. The First Line and the Last Line numbers are interpolated independently of each other.

Save/Recall Menu State

Use the Save/Recall State function in the Macro panel in the Paint Environment (page 4-394) when you record or use a Macro for animation. Before actually recording the Macro, when you've set the menus for the Macro, press the Save State Button. Then immediately after pressing Record Macro, press the Recall State Button and choose the file-name that you've saved the menu state to. This will ensure that each time you run the Macro, it will automatically reset the menu states for the Macro.

NOTE

You can see the text file of the Macro with numbered lines by pressing the Edit Macro Button in the Macro Panel in the Paint Environment. See page 4-402.

5.7.9 Switcher Actor Popup

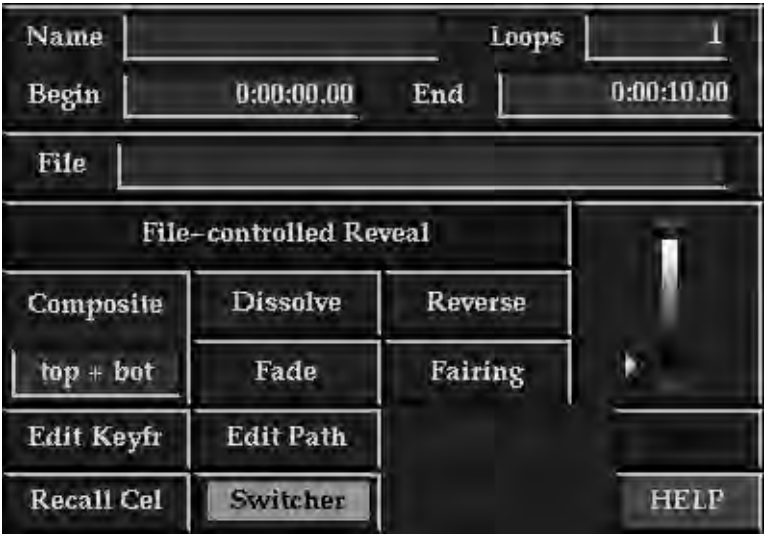

Figure 5-40. Switcher Actor Popup

The Switcher actor accomplishes fades and dissolves between layers of the animation. It can contain an image file to use as a pattern for wipes or reveal effects.

To create a Switcher effect:

- **Add a Switcher Actor to the Timeline.**
- **Add one Cel Actor above and one Cel Actor below the Switcher Actor.** The Cel Actors should have the same begin/end numbers as the Switcher Actor between them (This is not necessary, but simplifies the result). The bottom Cel Actor contains the image dissolved from; the top Cel Actor contains the image dissolved to.
- **Select and edit the Cel Actors and assign image files to them with the File Button on the Actor Popup.**

- **Press the Switcher Actor to select it.**

- **Turn on the Switcher mode you want to use.** If you use File-controlled Reveal, assign it a file.

NOTE

If there are multiple layers in an animation, a Switcher actor dissolves from all layers below it to all layers above it. To dissolve between two actors only, use keyframes to control the transparency of the two actors, see page 5-104.

Switcher Modes

Only one Switcher Mode can be active at a time. The four Switcher Modes are: File-controlled Reveal, Dissolve, Fade, and Composite.

File-controlled Reveal Button

Press to turn on. When this Switcher Mode is on, the dissolve between the two images is controlled by an image file from the disk. The alpha of the image file determines the progressive steps of the dissolve. For instance, if the image file is a luminance mask of a face, then the image would start dissolving in at the shadows, and the lightest spots would be the last to disappear. Because Liberty uses the alpha of the image, masks are often used for their files. For example, if you want to make a left-to-right wipe, you make a white-to-black gradation with Apply. Then you use Mask Channels to mask its Luminance, and use the File Mode Popup to save the mask.

Switcher actors, in "File-controlled Reveal" mode, can perform transitions with multiple files. This allows the mask for the file-controlled reveal effect

to change over time. The controls for a multi-file Switcher Actor work like controls for other multi-file actors (such as Cel and Mask). Pressing on the Single Button in the Actor Edit Menu brings up a Multiple File Popup. Or, when selecting the file-name assigned to the Switcher Actor, press the "film" button in the Recall Popup, and enter into the Full-Screen Animation Filmstrip Browse Popup. You can select multiple files there.

Switcher Composite Button

Figure 5-41. Switcher Composite Popup

The Switcher Composite Button calls up a popup with six special compositing modes. Each mode provides a special compositing effect along with a slider scale to control the brightness of the resulting effect.

Plus Mode (top+bot)

When this mode is enabled, the pixels of the top and bottom layers are added together. This causes brightness to increase, so a slider is provided to off-set excessive brightness. The bottom, or zero, slider setting leaves the resulting brightness unchanged. Raising the value of the slider decreases brightness.

Plus mode is good for compositing transparent elements such as flame, smoke or ghost-effects.

Subtract Mode (top-bot)

When this mode is enabled, the pixels of the bottom layer are subtracted from the pixels of the top layer. This causes brightness to decrease, so a slider is provided to offset low brightness. The bottom, or zero, slider setting leaves the resulting brightness unchanged. Raising the value of the slider increases brightness.

Subtract Mode works in a similar way to the Difference Matte function. For instance, in a medical imaging application, an x-ray of an arm with no sensitive fluid in the veins might be subtracted from the same image with sensitizing fluid in the veins. The difference - the veins only - would be composited.

Multiply Mode (top*bot)

When this mode is enabled, the pixels of the bottom layer are multiplies by the pixels of the top layer. This can cause brightness to greatly increase, so a slider is provided to offset excessive brightness. The bottom, or zero, slider setting leaves the resulting brightness unchanged. Raising the value of the slider decreases brightness.

Divide Mode (top/bot)

When this mode is enabled, the pixels of the top layer are divided by the pixels of the bottom layer. This causes brightness to decrease, so a slider is provided to offset low brightness. The bottom, or zero, slider setting leaves the resulting brightness unchanged. Raising the value of the slider increases brightness.

Greater Than Mode (top>bot)

When this mode is enabled, the composite uses a pixel of the top layer if it is brighter than the corresponding pixel in the bottom layer. Otherwise the pixel from the bottom layer is used. The slider does not affect brightness.

Less Than Mode (top<bot)

When this mode is enabled, the composite uses a pixel of the top layer if it is less bright than the corresponding pixel in the bottom layer. Otherwise the pixel from the bottom layer is used. The slider does not affect brightness.

Switcher Dissolve Button

Press to turn on. When this mode is on, layers above the Switcher Actor replace the layers below the Switcher Actor, as rendering proceeds.

Switcher Fade Button

Press to turn on. When this mode is on, the layers above the Switcher actor fade onto the layers below it; the bottom layers are not replaced, but can be seen through transparency in the image fading in. Fade is used when the incoming image has transparency in it, so you can see the image it is fading onto.

Switcher Reverse Button

Press to turn on/off. Performs the current Switcher effect backwards.

Switcher Fairing Button

Press to turn on/off. When this mode is on, the effect happens with ease-in and ease-out.

Switcher Softness Slider

Press and drag to change the softness of the File-controlled Reveal effect. When the slider is at the bottom, the effect is hard-edged. When the slider is at the top, the effect has maximum diffusion.

NOTE

Generally in the Animation Environment, you can use *any* combination of layers and keyframe attributes. Thus you can use any combination of Mask Actors, Switcher Actors, and Morph Actors. All keyframes attributes, including Alpha and Under, will work, regardless of how you layer the actors.

5.7.10 Color-Table Actor Popup

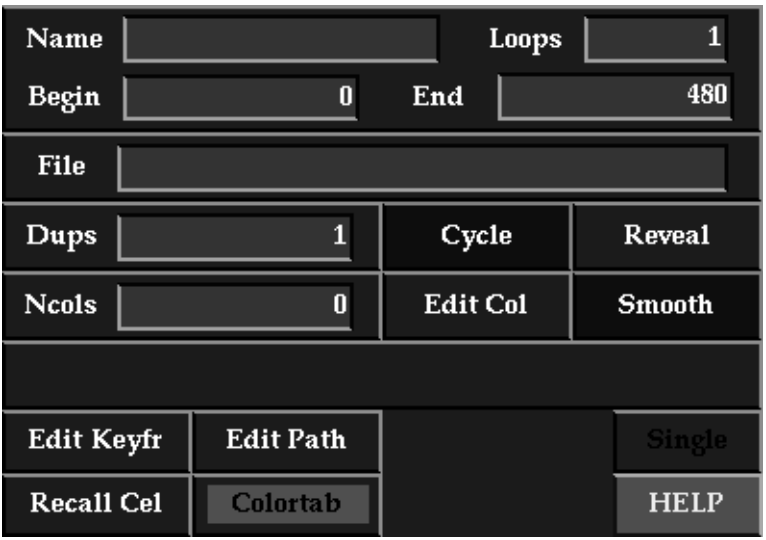

Figure 5-42. Color-table Actor Popup

The Color-table actor allows you to create animated color cycle effects. You can create cycling effects in which a series of colors cycle through a gray-scale ramp in a file created in Paint and saved on disk. Or you can create color-reveal effects, which, instead of cycling colors, turns the colors on one-by-one until they are all revealed.

To create a color-table animation:

- **Add a Color-table actor to the Timeline.**
- **Assign a file to it, using the File Button.** The Color-table Actor only uses the gray-scale of whatever image you assign, but it can be a full-color image.
- **Press the Ncols Button and type in the number of colors you want to use in the palette.** For example, you might type 8. The cycle will be comprised of the 8 topmost, leftmost colors in the palette.
- **Press the Edit Col Button to bring up the Color Palette.** If you try to call up the palette when Ncols is at 0, you get an error message: "No colors, change Ncols." This is a palette for just this Actor, and has no relation to the palette in the Paint Environment.
- **Set some of the top color boxes in the palette to colors that you want to be in your cycle.**
- **Press the Edit Col Button a second time to remove the color palette.**
- **Turn on the mode you want the Actor to use.**

The selected colors will be applied to the levels of gray in the file you assigned to the actor. The first color selected in the palette (top-most, left-most) is

assigned to the darkest color in the gray-scale image. The cycle travels from light to dark. To reverse direction you must invert the values of the original gradation in the file you save to disk. (See "Color Correct Popup" on page 4-301 for more information.)

Color-table File Button

Press to call up the File Popup and choose an image file whose gray-scale the Color-table actor will use to cycle colors through.

Any image file can be used, not just images with gray-scale only. The Color-table actor uses the luminance range it finds in the image file and applies the selected colors from the palette.

Color-table Duplicate Button (Dups)

To set the number of fields it takes to cycle the color table one step:

- **Press the Dups window.**
- **Type in a new number of fields (press Enter)**.

You can also increment the Dups number by pressing the top half of the Dups label (the word itself) and decrement by pressing the bottom half of the Dups label.

Color-table Cycle Button

Press to turn on/off. When on, this mode causes the selected colors to cycle through the gray-scale from light to dark.

Color-table Reveal Button

Press to turn on/off. When on, initially all colors are transparent, and thus invisible. Then, one by one each color is revealed, starting with the one assigned to the darkest values.

Color-table Ncols Button

Press to set the number of palette colors to be used. The maximum is 256, in which case the Color-table Actor would use all 8 palettes of 32 colors each in the Color Palette Elevator.

The number of colors set in Ncols is the length of a single cycle. For example, with 30 colors set in Ncols and the Dups Button at 2 (fields), one cycle lasts 30 frames (1 second, 60 fields). In this case, if the Color-table actor has a duration of 3 seconds, the cycle repeats 3 times.

Color-table Edit Col Button

Press to display the color palette. Set the colors to be used in the color-table animation. Use the top-most, leftmost colors in the palette.

Color-table Smooth Button

Press to turn on. When on, the color-table animation proceeds in soft dissolves rather than hard cuts.

5.7.11 Mask Actor Popup

The Mask actor calls up a mask file from disk to control a masked effect on another actor. The term "mask" in the Liberty Animation Environment means to change the way another image displays.

To create a masked effect:

- **Add a Mask Actor to the Timeline above the actor which you want to mask.** Usually the Mask Actor should have the same begin and end times as the actor to be masked below it.
- **Press the File Button to assign a file to the Mask Actor which is selected on the Timeline.**
- **Press on one of the Mask modes to activate it.** The modes are: Mask, Chroma, Brightness, Contrast, Tint, Hue, Ripple, Filter, Poster, Mosaic, Gamma, HSV, RGB, Diagram Correct, and Blur.
- **Press the Edit Keyframe Button**. The Keyframe Timeline appears.
- **Press on a matchstick to edit a keyframe.** The Keyframe Distort Popup appears along with a popup for the current Mask mode.
- **Edit the keyframes using the Distort Popup and the Mask Mode Popup.**
- **Press the Edit Keyframe Button a second time to remove the popups.**
- **Preview the animation.**

Mask Mode Popups

When you press the Edit Keyframe Button to call up the Keyframe Timeline, a popup also appears for the current mask mode (at the right of the Timeline). This popup allows you to set keyframe-able mask attributes. It contains options for the current mask mode. For example, if the Mask Actor is in Brightness Mode, then the Mask Mode Popup has a slider for brightness.

The values set by sliders and buttons in the Mask Mode Popup are keyframe-able. For example, in Brightness Mode you could set the first keyframe to a brightness of 0 and the last keyframe to a brightness of 200. In the animation, the masked area would begin with no change to its brightness and gradually become very bright. *A value of -100 will set the masked area to black.* If you want, you can add keyframes in between to control the brightness further.

All the Mask Mode Popups have Next and Prev Buttons for moving between keyframe matchsticks (the same as on the Distort Popup). There is also a large Preview Button, which you press to see a preview of the current Mask actor applied to the actor below it.

The only Mask modes that don't have (or need) Mask Mode popups are Mask and Tint Modes.

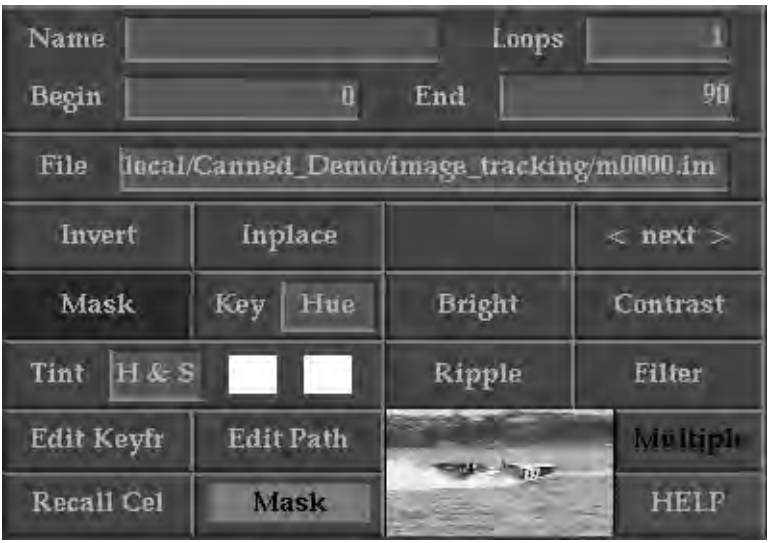

Figure 5-43. Mask Actor Popup (1)

Mask Modes

Only one of the Mask modes can be on at a time.

Mask Mode

Press to turn on. When turned on, the actor below the Mask Actor is revealed only through the mask. For instance, to give the effect of a keyhole through which you can see the action, you would put a key-hole-shaped Mask Actor over a Filmstrip Actor. The more opaque the mask, the more the mask reveals. An area of 100% transparent background color in the mask file allows nothing to be revealed through the mask. For example, a fully opaque piece of text on a fully transparent background used as a file for a Mask displays only inside the text.

Chroma Key Mode

Press the Key Button on the Mask Actor Popup to turn on Chroma Key Mode. When on, the actor below is masked according to the similarities of the its image to the color set in the Chroma Key Mode Popup. This works exactly the same as the Mask Channels Button in the Paint Environment, but instead of masking all of a particular color, it masks all but that color.

By using the Invert Button (see page 5-179) you can mask out the color instead of masking out every-thing except the color.

To set the color used by the Mask Actor in Chroma Key Mode:

- **Press the Edit Keyframe Button to call up the Keyframe Edit Popup.**
- **Press on the first keyframe to edit it.**

- **Press on the color swatch in the Chroma Key Mode Popup (the default is black).** The Color Palette is called up.

- **Select a palette box, and create the color you want to key off of.** A good way to do this is to recall the full-color image from the actor below, and use the color pick button to pick the color you wish to key on into the palette.

- **Press on the color swatch again.** It changes to the new color.

Repeat steps 2 through 5 with all the remaining keyframes. If you want to, you can have the color change from keyframe to keyframe.

Also on the Chroma Key Mode Popup are the Greed and Smoothness slider scales, which work identically to the Greed and Smoothness slider scales on the Match Mask Popup in the Paint environment.

If there is a file assigned to the Mask Actor, it is used as a garbage matte, and masks the file below exactly the same as Mask Mode.

Brightness Mode

Press the Brightness Button on the Mask Actor Popup to turn on Brightness Mode. When turned on, the brightness of the masked area in the actor below is changed according to the Brightness Slider on the Mask Mode Popup. The slider works identically to the Brightness Slider on the Adjust Popup in the Paint Environment. The default is -100 (black).

NOTE

The Brightness Actor operates on all layers below it. To make it just affect the row directly below it, place a mask actor in mask mode directly above the brightness layer (a fully opaque mask can be used for the mask layer).

Contrast Mode

Press the Contrast Button on the Mask Actor Popup to turn on Contrast Mode. When turned on, the contrast of the masked area in the actor below is changed according to the Contrast Slider on the Mask Mode Popup. The slider works identically to the Contrast Slider on the Adjust Popup in the Paint Environment. The default is 0 (no change).

NOTE

The Contrast Actor operates on all layers below it. To make it just affect the row directly below it, place a mask actor in mask mode directly above the Contrast layer (a fully opaque mask can be used for the mask layer).

Tint Mode

Press the Tint Button on the Mask Actor Popup to turn on Tint Mode. When on, a tint is applied into the masked area in the actor below. Works like the Tint function in the Image Tools 1 Panel in the Paint Environment.

Set the beginning tint color by pressing on the left Tint Color Button. The Color Palette appears. Set the first selected color to the value you want to start the tint with. Press the left Tint Color Button a second time to remove the Color Palette and set the

color. In the same way, set the right Tint Color Button to determine the end Tint color. The Mask Actor starts with the first color and interpolates to the second. Double-clicking the second color copies the first color to the second.

The Tint button has a toggle window to select either "Hue" or "H & S" (Hue & Saturation) modes.

H & S Mode

Press in the window of the Tint button to alternatively change between "Hue" and "H & S" modes. Set to H & S Mode. The tint is applied to Hue and Saturation values of the image.

Hue Mode

Press in the window of the Tint button to alternatively change between "Hue" and "H & S" modes. Set to Hue. It works the same as "H & S" Mode, but only the hue is affected. This preserves white highlights. It works similarly to Tint-Hue in the Paint Environment.

NOTE

The Tint Actor operates on all layers below it. To make it just affect the row directly below it, place a mask actor in mask mode directly above the Tint layer (a fully opaque mask can be used for the mask layer).

Ripple Mode

Press the Ripple Button on the Mask Actor Popup to turn on the Ripple Mode. When on, a ripple distortion is performed on the masked area in the actor below, according to the setting of the Ripple Slider in the Mask Keyframe Popup. The file assigned to

the Mask Actor is used as the "mask" the ripple refracts with. For example, a Mask Actor could use Ripple to animate a glass or water effect. It works identically to the Ripple Button in the Image Tools1 Panel in the Paint Environment. Depends on variations in alpha (transparency) in the Mask Actor's file.

NOTE

The Ripple Actor operates on all layers below it. To make it just affect the row directly below it, place a mask actor in mask mode directly above the Ripple layer (a fully opaque mask can be used for the mask layer).

Filter Mode

Press the Filter Button on the Mask Actor Popup to turn on Filter Mode. When turned on, the masked area in the actor below is filtered through a user-defined filter. Pressing the Select Filter Button on the Mask Keyframe Popup calls up the Filter Popup to allow you to choose a filter. Pressing OK on the Filter Popup assigns the current filter to the selected keyframe.

NOTE

The Filter Actor operates on all layers below it. To make it just affect the row directly below it, place a mask actor in mask mode directly above the Filter layer (a fully opaque mask can be used for the mask layer).

Figure 5-44. Mask Actor Popup (2)

Posterize Mode

Press the Poster Button on the Mask Actor Popup to turn on Posterize Mode. When turned on, the masked area in the actor below is posterized according to the Posterize Slider on the Mask Mode Popup. The slider works identically to the Posterize Function on the Tools1 Panel in the Paint Environment.

NOTE

This actor operates on all layers below it. To make it just affect the row directly below it, place a mask actor in mask mode directly above the Posterize layer (a fully opaque mask can be used for the mask layer).

Mosaic Mode

Press the Mosaic Button on the Mask Actor Popup to turn on Mosaic Mode. When turned on, the masked area in the actor below is given a mosaic pattern according to the Mosaic Sliders on the Mask Mode Popup. The sliders works identically to the Mosaic function on the Image Tools 1 Panel in the Paint Environment.

NOTE

This actor operates on all layers below it. To make it just affect the row directly below it, place a mask actor in mask mode directly above the Mosaic layer (a fully opaque mask can be used for the mask layer).

Sharpen Mode

Press the Sharpen Button on the Mask Actor Popup to turn on Sharpen Mode. When turned on, the masked area in the actor below is sharpened. The function works identically to the Sharpen function on the Image Tools 1 Panel in the Paint Environment.

Blur Mode

Press the Blur Button on the Mask Actor Popup to turn on Blur Mode. When turned on, the masked area in the actor below is blurred. The function works identically to the Blur function on the Image Tools 1 Panel in the Paint Environment.

HSV and RGB Modes

Press the HSV Button on the Mask Actor Popup to turn on HSV Mode. When turned on, the masked area in the actor below is adjusted according to the

sliders on the Mask Keyframe Popup. These sliders work identically to the Color Correct Popup on the Image Tools 1 Panel in the Paint Environment.

Press the RGB Button on the Mask Actor Popup to turn on the RGB Mode. RGB Mode is identical to HSV Mode, but the sliders adjust the Red, Green, and Blue of the image instead of the Hue, Saturation, and Value.

NOTE

This actor operates on all layers below it. To make it just affect the row directly below it, place a mask Actor in Mask Mode directly above the Gamma layer (a fully opaque mask can be used for the mask layer).

Color Correct Mode

Press the Correct Button on the Mask Actor Popup to turn on Color Correct Mode. When turned on, the masked area in the actor below is color-corrected according to settings on the Color Correct Popup. The function works identically to the Color Correct function on the Image Tools1 Panel in the Paint Environment.

Adjust Mode

Press the Adjust Button on the Mask Actor Popup to turn on Adjust Mode. When turned on, the masked area in the actor below is adjusted according to settings on the Adjust Popup. The function works identically to the Adjust function on the Image Tools1 Panel in the Paint Environment.

Figure 5-45. Mask Actor Popup (3)

Noise Mode

Press the Noise Button on the Mask Actor Popup to turn on Noise Mode. When turned on, the masked area in the actor below has noise applied to according to the settings on the Noise Popup. The function works identically to the Noise function on the Image Tools1 Panel in the Paint Environment.

Bump Map Mode

Press the Bump Map Button on the Mask Actor Popup to turn on Bump Map Mode. When turned on, the masked area in the actor below is bump-mapped. The function works identically to the Bump Map function on the Image Tools 1 Panel in the Paint Environment.

Gamma Mode

Press the Gamma Button on the Mask Actor Popup to turn on Gamma Mode. When turned on, the gamma of the masked area in the actor below is changed according to the Gamma Slider on the Mask Mode Popup. The slider works identically to the Gamma Slider on the Adjust Popup on the Image Tools1 in the Paint Environment.

NOTE

This actor operates on all layers below it. To make it just affect the row directly below it, place a mask Actor in Mask Mode directly above the Gamma layer (a fully opaque mask can be used for the mask layer).

Chroma Key Mode

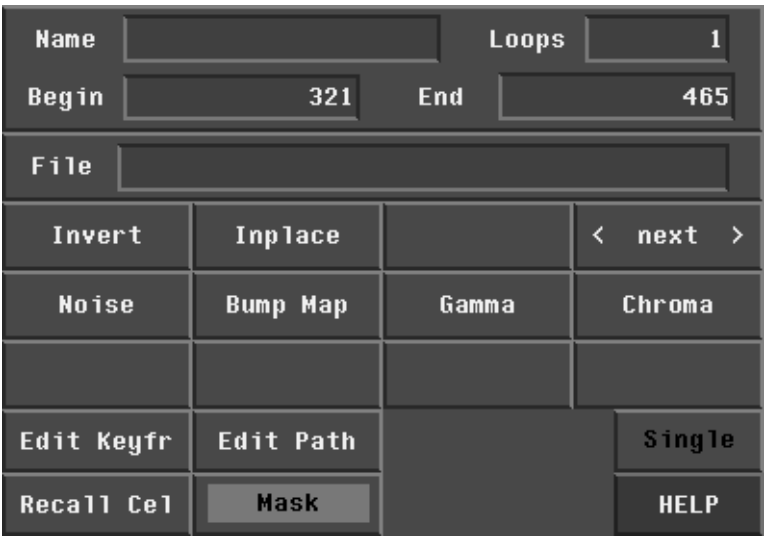

Figure 5-46. Mask Actor Popup (3)

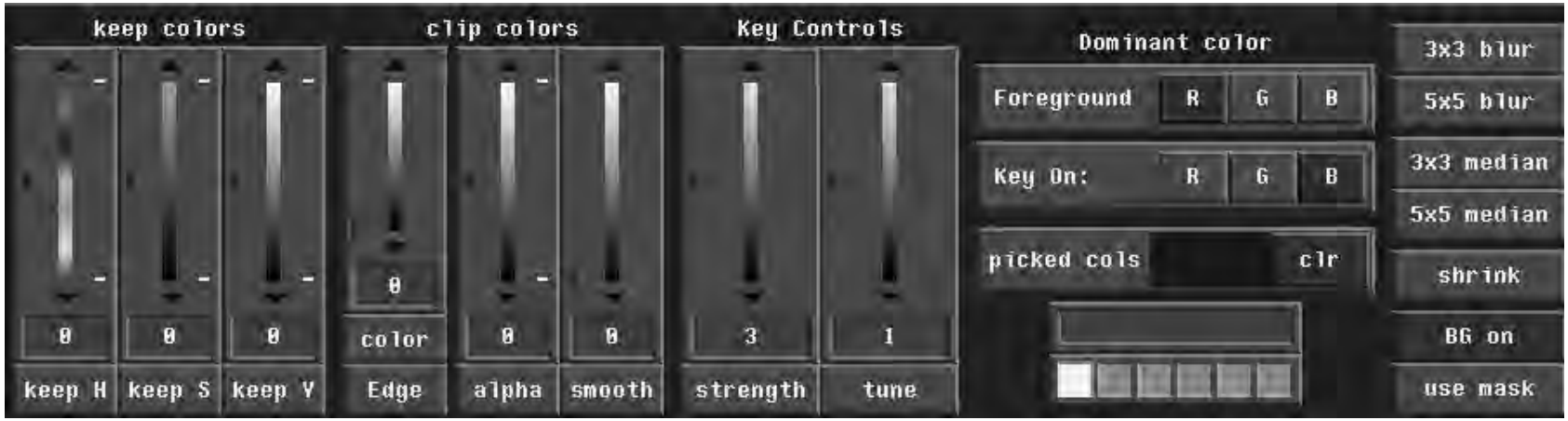

Figure 5-47. Chroma Key Popup

A Mask Actor in Chroma Key Mode allows you to key one Cel Actor into another one.

To use the Chroma Key Mask Actor:

- 1. Add a Mask Actor to the Timeline.
- 2. Press the Chroma Button in Mask Panel 3 to make it a Chroma Key Mask Actor.
- 3. **Below the Mask Actor add a Cel actor containing one or more blue screen images to the timeline.**
- 4. **Below the blue screen Cel Actor add another Cel Actor with the image to be keyed in.**
- 5. **Press the Edit Keyframe Button and edit the keyframes.** A large "Edit Key" button appears to the right of the Paste/Distort Menu.
- 6. **Press the Edit Key Button.** This brings up the Chroma Key Popup, which allows you to set the chroma key parameters for the current keyframe.
- 7. Finish editing the chroma key and exit Edit Keyframe.

The Mask Actor Chroma Key Popup is similar to the Chroma Key Popup in the Paint Environment (see page 4-337). The preview buttons work in a slightly different manner, and the "BG on" button is grayed out (since the actors below the key will render as the background). The preview buttons work slightly differently since previewing in animation really amounts to rendering the animation at the current keyframe. In the Mask Actor the Preview Button in the Chroma Key Popup does that, while the Preview Alpha Button previews the alpha generated by the key (as in Paint). The Preview BG button renders all

the actors below the blue screen cel actor and mask actor, since these represent the background. Again, these are rendered at the current keyframe. The Recall FG Button recalls the current frame of the blue screen cel actor, so that blue screen colors can be picked using the Chroma Key Popup (note that this button is labeled "Preview Off" in the Paint Environment, since it is simply turning the preview off and showing the canvas rather than recalling a file from an actor, as in the Animation Environment).

As in Paint, you can turn on the Use Mask Button in the Chroma Key Popup to enable a mask to be used as a garbage matte. Use the Mask Actor's File Window to assign a mask from disk to be used as a garbage matte. Use the Single/Multiple controls to specify multiple files. If the Use Mask Button is off, no file needs to be assigned to the Mask Actor.

You can set individual chroma key parameters for each keyframe in the Mask Actor, or just set parameters for the first and last keyframe (in which case, the keyframes in between are interpolated).

Ultimatte Plug-in

Note that Liberty supports an Ultimatte Cinefusion plug-in. This plug-in provides a far more advanced set of controls for blue and green screening than the Chroma Keying tool described here. Thus, you may prefer to purchase and use the plug-in for the more difficult or intensive chroma keying jobs.

Mask File Button

Press to call up the File Popup and choose a file from the disk. This file performs a different service for the different mask modes. In the modes that

mimic functions on the Image Tools Panels, the file works like a Paint Environment Mask. With both Chroma Key and Mask Mode, the file is used as a way of only showing part of the image.

The Mask Actor only uses the alpha (transparency) information in a file, regardless of the RGB (color) information. Because of this, it is often easier to use a mask saved on the disk instead of an image, because a mask is essentially an image made up of only alpha information.

Mask Invert Button

Press to turn on/off. When on, inverts the mask before it is used. This means that the mask is inverted or that the complement of the mask is used. For instance, if the Mask Actor has a solid circle as its reference file, like a spotlight, inverting it would cause the mask to appear everywhere except inside the circle. This is true of all Mask Actor Modes except Ripple. There is a difference between a normal Ripple and an inverted Ripple, but it's slight, not very predictable, and generally not useful.

Using Invert Mode can be especially useful with the Chroma Key Mode. With Invert Mode on, the Chroma Key Mode masks out a color, and whatever file is assigned to the actor can be used to filter out any garbage that slips by the Chroma Key.

Mask Inplace Button

Press to turn on/off. If Inplace is turned on, the mask effect is applied to the actor below before the actor is transformed (rotated, scaled, etc.) and pasted onto the Canvas. Then the masked result is pasted onto the Canvas transformed by the keyframe of the actor below. For example, a perspective view of a

spotlight shining on a background texture would appear with both the spotlight and the texture in perspective.

If Inplace is turned off, the mask effect is applied to the actor below after the actor is pasted onto the Canvas. A perspective view of the background texture would appear in the non-perspective spotlight.

Experiment with this mode on and off to get a feel for its effect.

More About Mask Actors

All Mask Actors are controlled by their Keyframe Alpha Slider. Decreasing alpha on a *mask mode* (Brightness Mask, Ripple Mask, etc.) causes the effect to become more transparent relative to the original image. Decreasing alpha on a *mask* (the Mask Actor's Mask Button is highlighted) causes a dissolve between the masked and un-masked image. At full opacity (100% alpha) the mask actor fully blocks out the un-masked area. As alpha comes down, the unmasked area dissolves in.

NOTE

To fade the masked element, apply the alpha change to the element itself, not its mask.

You can perform *any* combination of layers and keyframe attributes. Thus you can use any combination of Mask Actors, Switcher Actors, and Morph Actors. All keyframes attributes, including Alpha and Under, will work, regardless of how you layer the actors. Also, the Mask In-place function will work, regardless of how many layers of Mask

Actors you use. If a Mask Actor has In-place turned on, all Mask Actors directly below it become In-place as well.

REMINDER: When a Mask Actor's In-place Mode Button is turned on, the mask is applied *before* the next lower actor's rotation, scaling, position, etc. is calculated.

Multiple layers of Mask Actors are calculated multiplicatively. This allows all combinations of all kinds of Mask Actors to always work correctly. For example, two stacked Mask Actors both set at 50% transparency will yield a result of 25% (50% times 50%).

You can use Liberty and non-Liberty RGB and RGBA files in Mask Actors. When you use a non-Liberty file as a Mask, the alpha channel is used. When you use an RGB file as a Mask, the luminance is used.

Rotation and Scaling of Actors Larger Than the Screen

You can pan, rotate, scale, and slant actors created at a higher resolution than the display screen. This means that they are larger than the screen you are rendering animation in. These larger actors include Cel Actors, Mask Actors, and Switcher Actors. A Temp or Mask Buffer large enough to hold the larger file is temporarily allocated to do this. You'll need sufficient RAM to support this. Masking of panning backgrounds will work, even if In-place is on.

5.7.12 Reference & Troupe Actor Popups

The Actor Popups for these two Actor Types are identical, consisting of only a File Button. The Edit Path and Edit Keyframe Buttons work the same as with any other actor, but the Recall Cel Button and the Browse Window do not work with these actors, as they have no image file assigned to them.

Both types perform the same function. By assigning either type an animation file that has been stored on disk, you include that entire animation in your Timeline, which can be moved, stretched and keyframed like any other actor. It's an easy way to combine several animations. The difference between the Reference Actor and the Troupe Actor is that the Troupe Actor allows you to edit its actors (without changing them in the original file on disk) and the Reference Actor does not.

To add an animation into the Timeline, add a Reference or Troupe Actor to the Timeline. Press the File Window in the actor's Popup Menu and choose an animation file from the disk for the actor to refer to.

If there is a Holdin or Holdout in the source animation, it is ignored when a Reference or Troupe Actor referring to it is rendered. If you need the hold, render the first or last frame of the source animation, save it, and then use it as a file for a Cel Actor.

Show Troupe Button

This button is at the bottom of Actor Edit Menu to the left of the Animation Timeline. It is used for both Reference and Troupe Actors.

When you first assign an animation to a Troupe or Reference Actor, all the actors in the animation appear on the Timeline. If you press on the Show Troupe Button and then press on the Reference or Troupe Actor, all the actors of the referenced animation are "hidden," and only the Reference or Troupe Actor itself is shown.

If you press the Show Troupe Button, and then press on a Reference or Troupe Actor whose actors are hidden, they will be shown again.

Whether the actors of a Reference or Troupe Actor are hidden or shown, they remain a part of the animation unless turned off by the Off Button (see page 5-123).

5.7.13 Shapes Actor Popup

Figure 5-48. Shapes Actor Popup

The Shape Actor allows you to animate from one shape to another, using the same tools as in the Shapes Popup in the Paint Environment. You can add a different shape at each keyframe and it will be smoothly “morphed” to the next keyframe shape. These can function either like a Write-on Actor,

painting around or filling the shape with color, or like a Mask Actor, masking and applying effects to the layer(s) below.

When animating from one keyframe shape to another, the two shapes do NOT have the same number of vector points. In such cases you can specify where the missing points come from as the shapes animate. Note, however, that circles and ellipses must animate to or from circles and ellipses.

To create a Shape Actor:

- In the Animation Environment, clear the Timeline, if necessary.
- Add a Shape Actor to the Timeline and press on it to edit it.
- Press the Edit Keyframe Button. The Keyframe Edit Popup appears.
- **Press the first Keyframe Matchstick to edit it.** The Shapes 3-D Paste Popup appears.
- **Press the Edit Shape Button at the right of the Timeline.** The Shapes Actor Popup appears. On the Canvas, the default shape is a square.
- Press the Rectangle Button and press and drag on the Canvas to create a rectangle.
- Press the Replace Keyframe Button (Replace Kf).
- Press and drag the indicator on the Shapes Timeline to see a wireframe preview of the animation between the first and last keyframes.
- Press the necessary OK Buttons to get back to the main Timeline.

- Be sure the Fill Button at the right of the Timeline is highlighted.

- Render a Storyboard of the animation and play it back.

Shapes Actor Popup

Press the Edit Shapes Button to bring up the Edit Shapes Popup.

The Shapes Actor Popup is identical to the Shapes Popup in the Paint Environment, except that here the Shapes Inbetweening section at the top is always active and has a minimum of two keyframes. Also, the Inbetweening section's Add Kf, Delete Kf, and Copy Kf buttons are grayed out, because when editing a Shapes Actor, you add keyframes to the main animation Timeline in the normal way, see page 5-70. For the basic procedure of working with the Shapes Popup, see page 4-253.

Initially each keyframe contains a simple square Shape by default.

When you are editing a keyframe in the Shape Actor, you can use any of the Shapes tools to create or modify a geometric shape for the current keyframe.

Inbetweening Timeline

At the top of the Shapes Actor Popup, press and drag the marker in the Inbetweening Timeline to choose different keyframes to edit. You can also use the Previous (<) and Next (>) Keyframe Buttons at either end of the Inbetweening Timeline to move among keyframes. The current keyframe's shape is visible and modifiable on the Canvas. If you try to

edit without having an existing keyframe chosen, an error message appears at the bottom of the screen in the Prompt Window.

Adding Keyframes While Editing Shapes

There is always a one-to-one correspondence between the actor's keyframes and the keyframes on the Inbetweening Timeline. If you want more keyframes in the Actor, press the OK Button twice, and use the Add Keyframe Button at the left of the main Timeline to add a keyframe where you want it. Then press on the keyframe to edit it (and press Edit Shape).

Replace Keyframe Button (Replace Kf)

After creating or modifying a shape in a keyframe, always press the Replace Keyframe Button. Until you do this, the new shape doesn't "take."

About Shape Points - The Link Keyframe Button (Link Kf)

The Link Keyframe Button allows you to control how a shape's points animate between keyframes. For example, when animating between two shapes with the same number of points, Liberty makes its best guess as to how the points should correspond. The Link Keyframe Button allows you to adjust which points in the first shape correspond to which points in the second shape.

Internally each shape's points have a certain order, and each shape has a start point. When you choose a keyframe (using the slider or the </> Buttons on the Inbetween Timeline), the start point is red. The rest of the points in the shape are ordered in either a clockwise or counter-clockwise direction. The sec-

ond point (one point either clockwise or counter-clockwise from the start point) is yellow, which helps you visualize how the points are ordered.

When a shape animates to another shape, the points are interpolated based on their order. The start point of the first shape animates to the start point of the second shape, while the second point of the first shape animates to the second point of the second shape, and so on for all the points. Press the arrow buttons (</>) on either end of the Link Keyframe Button to cycle the order of the points in the current shape. You can tell which way they're cycling by watching how the red (start) point moves. You can also change the order to either clockwise or counter clock-wise by pressing the labeled Link Window Button till it displays the desired direction, then pressing on the main part of the Link Keyframe Button.

To get the best in-betweening results with the least amount of folding and cross-over, place the start points of the two neighboring keyframes in the same relative position (for example, at the bottom of the shapes) and make the direction of the order the same (clockwise or counter-clockwise), and then press on the main part of Link Keyframe Button.

Move Keyframe Points Buttons (Move Prev/ Next Kf pt)

Use these buttons when the two shapes to be animated have a different number of points. For example, if the first shape has three points and the second shape has five points, the second shape's two extra points have to originate somewhere in the first shape. Maybe the second shape's extra points origi-

nate from the same point on the first shape. You can change how these points originate in the following way:

To change the origin position of extra points (from a triangle to a star):

- Add a new Shapes Actor to the Timeline.
- Press Edit Keyframe Button.
- Press on the second (last) keyframe on the Keyframe Timeline.
- Press the Edit Shape Button.
- Use the Star Button to create a star shape.
- Press the Replace Kf button.
- Choose the first keyframe (using the Inbetweening slider or left arrow (<) button).
- Use the Triangle Button to create a triangle shape.
- Press the Replace Kf button.
- Press the Move Next Kf pt Button. The point where multiple points originate turns blue. In this case, it's the lower-left point of the triangle.
- **Press and drag the seven multiple points out of the blue point.** As long as multiple points remain, the point stays blue. You can drag the points (one at a time) past other points in the shape to distribute them evenly, two points to a side. Note that the points turn green as you move them.
- **Press the necessary OK Buttons to return to the main Animation Timeline**.

- Render a Storyboard and play it back.

When the second shape has fewer points than the first shape, the procedure is the same, except that you choose the second keyframe and use the Move Prev Kf pt Button.

Shapes 3D Paste Popup

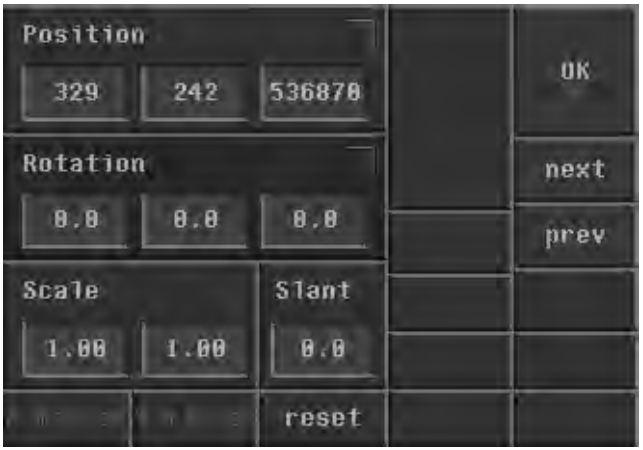

Figure 5-49. 3D Paste Popup

This popup appears when you click on a Keyframe Matchstick to edit it. It's the same popup as the one you use for scaling, rotating and slanting shapes in the Paint Environment. You can also bring up the 3D Paste Popup after you have pressed the Edit Shapes Button by pressing the Transform Button on the Edit Shapes Popup. Either way, the results are the same.

Shapes Actor Rendering Modes

Figure 5-50. Shapes Edit Popup

In the Shapes Actor's Actor Edit Menu (which appears at the right of the main Animation Timeline when you've high-lighted the Shape Actor), are a number of rendering modes. Choose these by using the Canvas Mode and Mask Mode Buttons, which in turn open up a number of variations.

When in Canvas Mode, the Shapes Actor functions much like a Write-on Actor. Any of the paint modes are used to paint along the outline of the shape, or to fill it solidly. Both brush size and brush gap are key-framable. When in Mask Mode, the Shapes Actor functions much like a mask Actor. All of the effects obtainable through the Mask Actor are applied through the animating shapes onto the layer(s) below. These include effects such as Posterize, Blur, Noise, Brightness, etc.

Canvas Mode

Press to choose Canvas Mode for the Shapes Actor, so that the shape paints to the Canvas using the color, brush style, brush mode, and brush parameters set in the Actor Edit Menu and the Keyframe Popup. In certain paint modes (Reveal, Smear) it reveals from the Cel Actor below for its effects.

Choose the Canvas Modes from the bottom three rows of the Actor Edit Menu. These include the brush colors, brush mode, and brush type:

Brush

Chooses the type of brush to draw with.

Color

Chooses the start/end colors used to draw the shape outline (when in Outline Mode). Colors are interpolated between the Start and End Color Buttons as the Actor renders. Press the Start or End Color Buttons to display the color palette. Modify the upper left palette box to the desired color, then press the Start or End Color Button again to confirm the new color.

Mode

Chooses the paint mode (Paint, reveal, Smear, etc.)

Other Canvas Mode variations:

Outline

Draws only the outline of the shape. By default, the entire shape is drawn at every field. (See below, Continuous Modes 1 and 2).

Fill

Fills the shape with the current color.

Continuous Mode 1

Draws the shape a piece at a time over the entire animation. Brush size and gap can change over the course of the shape's render.

Continuous Mode 2

Same as above, but brush size and gap are constant for any particular field. Brush size and gap do not change during the render.

Mask Mode

The Mask Modes in the Shapes Actor are similar to the Modes in the Mask Actor, see page 5-163.

Plug-in Actor

The Plug-in Actor allows you to apply a plug-in filter to the actor(s) below it.

The Plug-in Actor's File Window

The Plug-in Actor's File Window allows you to assign a file from the disk to use as a mask for the filter. When a file is assigned in the window, the filter is applied to the actor(s) below only inside the file's mask. If no file is assigned, the filter is applied over the entire Canvas.

Editing Keyframes of the Plug-in Actor

When you edit a keyframe of a Plug-in Actor, press on the large Edit Button at the right of the Timeline. The Plug-in Popup appears, identical to the Plug-in Popup in the Paint Environment, allowing you to choose which plug-in filter will be active, as well as its modifying functions.

5.8 MORPHING

Liberty provides two complementary morph programs: Triangle Morph and Line Morph. You can use both types of morphs in the Paint and Animation Environments. Triangle Morph is more complicated to use, but renders more quickly. In Triangle Morph you set and move control points, creating a triangular grid to make distortions. Line Morph is quite easy to use, and has a better result, but takes more time to render. In Line Morph you freely position and modify line segments in a gridless system to create distortions. Line Morph yields extremely organic and smooth results and is usually well worth the extra rendering time.

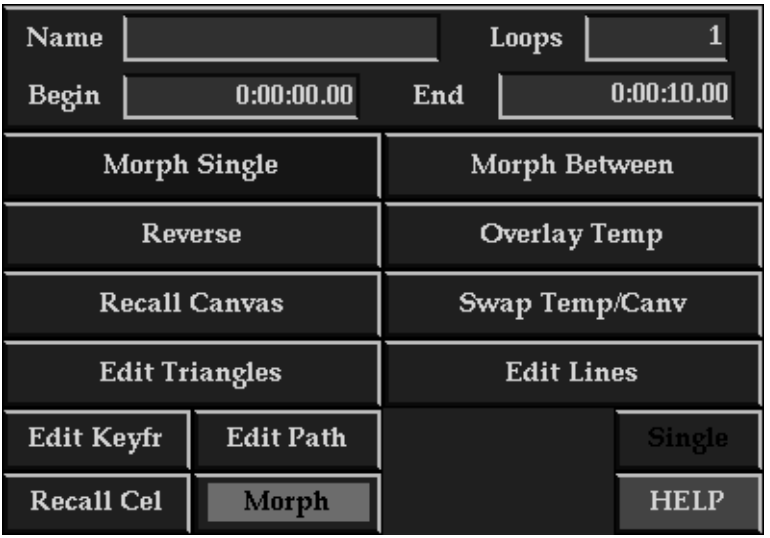

Figure 5-51. Morph Actor Popup

You start a morph animation by setting up the control points (Triangle Morph) or the line segments (Line Morph) that define the beginning keyframe of the morph. Then you move or modify the keyframe to create a distortion in the ending keyframe of the morph. Then you set a duration for the animation and render the morph using the Storyboard or Record functions.

Both Triangle Morph and Line Morph allow morphing of a single image or morphing between two images.

You can add keyframes between the beginning and ending of any morph.

The discussion of each type of morph begins with a step-by-step description of how to animate a morph between two images. This is followed by a function-by-function description of the morph buttons for each type of morph. First, Triangle Morph:

5.8.1 Triangle Morph: Step by Step

Figure 5-52. Triangle Morph Popup

To create a morph animation from one image to another:

- **Add a Morph Actor to the Timeline.** See adding actors, page 5-51.
- **Add a Cel Actor to the layer below the Morph Actor.** The Cel Actor should have the same begin and end numbers as the Morph Actor (this is not necessary, but simplifies the process).
- **Press the File Button in the Cel Actor Popup at the right of the Timeline and assign an image file to the Cel Actor you just added.** This will be the image that starts the morph.
- **Add a Cel Actor to the layer above the Morph Actor.** Again, the Cel Actor should have the same begin and end numbers as the Morph Actor.

- **Assign a disk image file to this Cel Actor as you did with the previous one.** This will be the image that ends the morph.

- **Press the lower Cel Actor to select it.**

- **Press the Recall Cel Button in the Cel Actor Popup at the right of the Timeline.** The starting image for the morph is recalled to the Canvas so that you can refer to it while setting the beginning of the morph.

- **On the Timeline press the Morph Actor to select it.**

- **Press the Morph Between Button in the Morph Actor Popup at the right of the Timeline.** This sets the actor to morph between two images.

- **Press the Edit Triangles Button in the Morph Actor Popup**. The Triangle Morph Popup appears. If an existing morph appears on the Canvas, press the Reset Button twice quickly to reset the morph. The Prompt Window at the top of the Canvas displays the message: "Please specify a bounding box on Canvas." For a button-by-button description of the Triangle Morph Popup, see page 5-139.

- **Define a bounding box around the area you want to morph.** Press down once to set the first corner of the bounding box. Without dragging, move the cursor to the diagonally opposite corner, and press down a second time. The bounding box should cover the area you want to distort. If you make a mistake you can drag the corners into better positions, but you must do it before you add any points.

- **Press the Add Button on the Triangle Morph Popup to add control points on the Canvas to define the beginning of the morph.** For example, if morphing a dog into a snake, add points to define the outline of the dog.

- **Press the Lock Button on the Triangle Morph Popup** when you've finished adding points**.** This locks down the points, defining the first morph keyframe. The yellow pointer jumps to the right end of the horizontal Triangle Morph Slider, automatically adding an ending keyframe to the morph.

- **Press the Edit Triangles Button to exit the Triangle Morph Popup.** The Triangle Morph Popup disappears.

- **Press the Swap Temp/Canvas to put the starting image into the Temp.** Whatever was in the Temp will appear on the screen.

- **Press the top Cel Actor to select it.** This contains the image you are morphing to.

- **Press the Recall Cel Button in the Cel Actor Popup.** The image you are morphing to is recalled to the Canvas for you to refer to while setting the ending of the morph.

- **Press the Morph Actor on the Timeline to select it and press the Edit Triangles Button.** The Triangle Morph Popup appears again. The points defining the beginning of the morph are again displayed on the Canvas.

- **Press the Move Button on the Triangle Morph Popup, then press and drag the control points on the Canvas, moving them to outline the image on the Canvas.** This sets the points defining the final keyframe of the morph. For

example, if morphing a dog to a snake: press and drag the dog's outline points to new positions outlining the snake.

- **Press the Erase OK Button to see the morphed version of the starting image.** The Triangle Morph Popup morphs whatever is in the Temp. Earlier, you put the starting image in the Temp using Swap Temp/Canvas. It will be morphed into its new form. This image will never actually appear on the screen, but it gives a general idea of what is going to happen. It is usually a far exaggerated version, though, and you must storyboard or final record the animation to see it completely (see page 5-251). When testing morph animations, set a very low duration (15 to 30 frames, depending on the complexity of the morph or whether additional keyframes have been inserted. See ***"Triangle Morph Add Keyframe Button" on page 5-140***.)

- **Press the Edit Triangles Button to exit the Triangle Morph Popup.** The Triangle Morph Popup disappears.

To morph one image instead of morphing between two, you must turn on the Morph Single Button in the Morph Actor Popup. In that case you need only one Cel Actor below the Morph Actor.

5.8.2 Line Morph: Step-by-Step

Figure 5-53. Line Morph Popup

To create a morph animation from one image to another:

- 1. **Add a Morph Actor to the Timeline.**
- 2. **Add a Cel Actor to the level below the Morph actor.** The Cel Actor should have the same begin and end numbers as the Morph actor (this is not strictly necessary, but simplifies the process).
- 3. **Press the File Button in the Cel Actor Popup at the right of the Timeline and assign an image file to the Cel Actor you just added.** This will be the image that starts the morph.
- 4. **Add a Cel actor to the level above the Morph Actor.** Again, the Cel Actor should

have the same begin and end numbers as the Morph Actor.

- 5. **Assign a disk image file to this Cel Actor as you did with the previous one.** This will be the image that ends the morph.

- 6. **Press the lower Cel Actor to select it.**

- 7. **Press the Recall Cel Button in the Cel Actor Popup at the right of the Timeline.** The starting image for the morph is recalled to the Canvas so that you can refer to it while setting the beginning of the morph.

- 8. **On the Timeline press the Morph Actor to select it.**

- 9. **Press the Morph Between Button in the Morph Actor Popup at the right of the Timeline.** This sets the actor to morph between two images.

- 10. **Press the Edit Lines Button in the Morph Actor Popup.** The Line Morph Popup appears. If an existing morph appears on the Canvas, press the Reset Button twice quickly to reset the morph.

- 11. **Press the Add Button on the Line Morph Popup to add line segments on the Canvas to define the beginning of the morph.** Press once to start a line segment; press a second time to define the end of the line segment. For example, if you are morphing one face into another, you place line segments along each of the features.

- 12. **Press the Lock Button on the Line Morph Popup.** This locks down the line segments you have added, defining the first morph keyframe. The yellow pointer on the Morph Slider jumps to the right end.

- 13. **Press the Edit Lines Button to exit the Line Morph Popup.** The Line Morph Popup disappears.

- 14. **Press the Swap Temp/Canvas to put the starting image into the Temp.** Whatever was in the temp will appear on the screen.

- 15. **Press the top Cel actor to select it.** This contains the image you are morphing to.

- 16. **Press the Recall Cel Button in the Cel Actor Popup.** The image you are morphing to is recalled to the Canvas for you to refer to while setting the ending of the morph.

- 17. **Press the Morph actor on the Timeline to edit it and press the Edit Lines Button.** The Line Morph Popup appears again. The line segments defining the beginning of the morph are again displayed on the Canvas.

- 18. **Press the Move Button on the Line Morph Popup and press and drag the line segments on the Canvas, moving, rotating, and scaling them to define the ending keyframe relative to the image on the Canvas.** Press on a line segment and drag it to move the line segment. Press just beyond either end and drag to rotate and scale the line segment. This sets the line segments defining the final keyframe of the morph. For example, if you were morphing one face into another, you would move each segment to match the corresponding features on the second face. In general, slight movements of the line segments between keyframes cause subtle effects while larger modifications of the line segments cause wildly warped and twisted distortions. In particular, if any segments flip over or intersect in the interim or final keyframes, the distorted picture will fold over on itself and may even

contain multiple distorted copies of the source image.

- 19. **Press the Erase OK Button to see the distorted version of the starting image.** The Line Morph Popup distorts whatever is in the Temp. Earlier, you put the starting image in the Temp using Swap Temp/Canvas. It will be distorted into its new form. This image will never actually appear on the screen, but it gives a general idea of what is going to happen. It is usually a far exaggerated version, though, and you must storyboard or final record the animation to see it completely (see ***"Preview Animation Button (In Brief)" on page 5-43*** for a quick overview.) When testing morph animations, set a very low duration (15 to 30 frames, depending on the complexity of the morph).

- 20. **Press the Edit Lines Button to exit the Line Morph Popup.** The Line Morph Popup disappears.

To morph one image instead of morphing between two, you must turn on the Morph Single Button in the Morph Actor Popup. In that case you need only one Cel Actor below the Morph Actor.

5.9 Motion Tracking

Motion Tracking is an optional software package for Liberty 32 (standard on Liberty 64) that incorporates three features:

- **Motion Tracking**
- **Motion Stabilization**
- **Warp Corners**

Motion Tracking

Motion Tracking is designed to follow a defined point (point mode) or warped group of points (corner mode) so that another element can be composited over the filmstrip and track the reference points. An example of this feature would be to track the license plate on a moving vehicle and replace it.

Motion Stabilization

As a complementary tool to Motion Tracking, Motion Stabilization is used to remove undesired movement in a filmstrip to stabilize what should be a stationary reference position. This feature is often used to remove film weave from digitized scenes before compositing elements.

Warp Corners

Warp Corners is part of the 3D Distort Paste Popup in the Paint Environment, or the 3D Distort Paste Popup in the Edit Keyframe function of the Animation Environment.

The artist can “pull” on any of the four corners of a paste image to distort the image to the desired effect. The Warp Corners feature makes it easier to position a pasted image to match a background element

instead of using the normal paste transform controls. See ***page 4-129*** (Paste Distort Mode) for more information.

5.9.1 Motion Tracking

Motion Tracking is designed to allow you to track an element (still or animated) along a track in a series of target frames. If the Motion Tracking option is not installed, the Motion Tracking Button will be grayed out. *(This button is located on the Image Tools 2 panel of the Paint Environment.)* The tracked element can be anything that can be distinguished from its surroundings in some way, usually by its luminance value. The Tracking function will create a series of points, generating a motion curve path. Or it will generate a set of four points defining a warp rectangle that follows an area in the target sequence.

Point Mode

In Point Mode, you are given one selectable point, Point1. When this point is tracked, a point list will be generated which has one point that corresponds to the location of the tracked area for every frame in the sequence. In Point Mode only the top row of Point Buttons are active; the rest are grayed out.

Point Mode is used to track one element over a filmstrip with only positional information with no size or rotational change to the tracking element.

Corner Mode

Corner mode works the same as Point Mode, except that you define four tracking paths. You should usually (but not always) define the four points starting with the lower left corner as Point 1 and move

counter-clockwise. This simplifies the task of the Warp Corners functions in the animation actor that the corner paths will be used in. Corner Mode is used so that the tracking element will be changed to match the reference area (size, perspective, rotation).

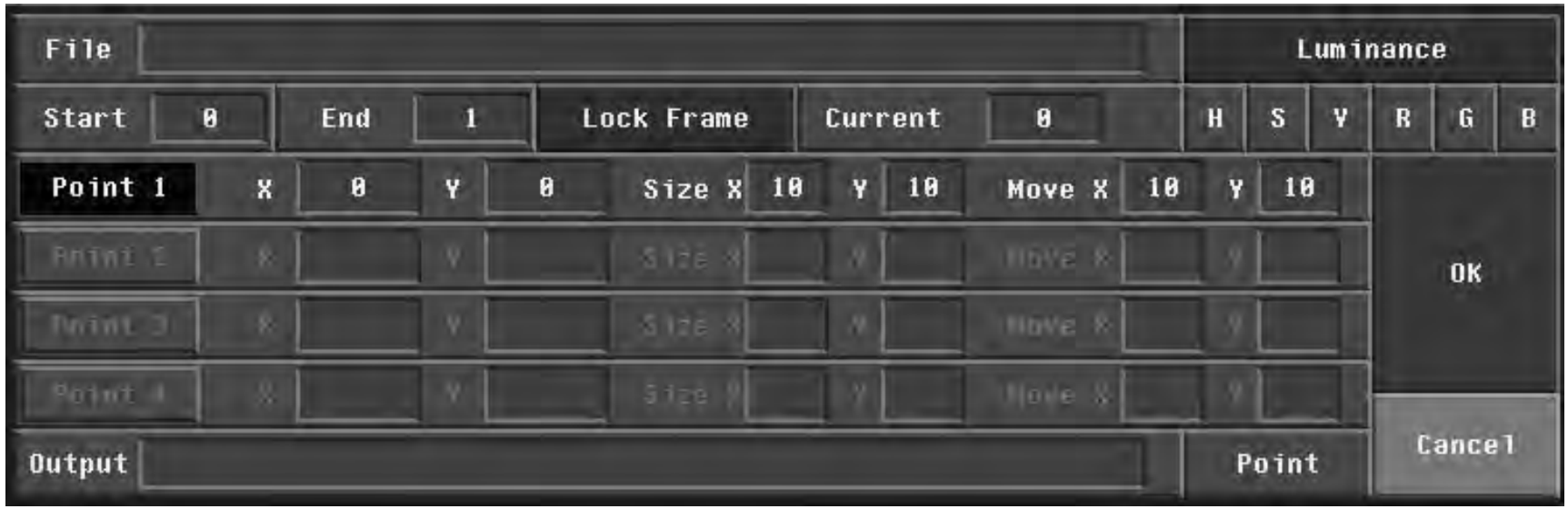

Figure 5-54. Motion Tracking

Motion Tracking Popup

Press the Motion Tracking Button on the Image Tools 2 panel in the Paint Environment to call up the Motion Tracking Popup.

File Button

The File Button specifies the target file sequence to work with. This is a sequence of files that contains a moving point or area that can be distinguished by luminance, or other component. The file sequence must be continuously numbered somewhere in the filename. Press on the window within the File Button and the File Popup appears. Press in the file list on one of the filenames in the sequence and it appears in the File Window. Press on the File Button itself to recall the current file to the Canvas.

Start Button

This button allows you to define the beginning or base frame of the target sequence you want to track. This is the file you will recall to the Canvas to set your Point values on. Press in the Start Window and type the starting number of the sequence.

End Button

Press in the End Window and type the ending number of the sequence you want to track.

Lock Frame Button

The Lock Frame Button allows you to set points manually for any given frame or series of frames in the animation being tracked. The start frame is always automatically locked, since you specify its points manually.

To lock points on a frame using Lock Frame:

- **Choose the frame you want to lock by pressing the Current Frame Window and typing the appropriate number.**
- **Recall the appropriate image file to help you choose the points.**
- **Use the Point Buttons to input the X and Y values for the desired points.**
- **Press the Lock Frame Button.** The points you entered are locked to this frame.

When a locked frame becomes the current frame, the Lock Frame Button becomes highlighted.

Current File Button

The window in this button displays the filename of the file currently being processed after you press the OK Button and tracking is proceeding. This is a display window only; you cannot input to it.

Point Buttons

The Point Buttons allow you to define the points on the Canvas that you want to track. There are two modes of operations for the Point Buttons: one, called Point Mode, that allows tracking of a single motion curve, and the second, called Corner Mode, that allows tracking of a four-sided polygon, or warp rectangle, which uses four motion paths. At the lower right of the Motion Tracking Popup is a Point/Corner Mode Button that toggles between Point Mode and Corner Mode.

Size Buttons (X and Y)

The X and Y Size Buttons allow you to define the size of the area you want to track, in pixels. This is the area that the tracking function "looks at" to trace motion on the basis of the luminance (or other component) of the area. The X Button defines the width of the tracked area and the Y button defines the height.

The size box of the current point is highlighted in red.

Move Buttons

The X and Y Move Buttons allow you to define a rectangle designating the maximum distance you expect the tracked area to move in a single frame. This value helps the Tracking function eliminate other areas outside the expected motion path. The X Button defines the width of the expected area of motion and the Y button defines the height.

Also, the procedure for recalling a corner list (generated during 4-Point Motion Tracking) into an animation actor has changed. This is now done using the Corner List Button in the Edit Path Menu.

NOTE

The larger the Size and/or Move values are, the longer the processing time for each frame in the sequence.

Point/Corners Button

When pressed, this button alternates between the Point Mode and the Corner Mode. When in Point mode, only one row of Point editing windows (X, Y, Size, Move) is available. When in Corners mode, all four rows of Point windows are enabled.

Output Button

The Output Button defines the name of the file containing the Point List or the Corner List. These are unique file types with unique suffixes when saved on the disk. A point file is listed as "filename.pt" and a corner file is listed as "filename.co." Press in the Output Window and the File Popup appears. Type a filename for the Point List to be saved under (if you are in Point Mode) or for the Corner List to be saved under (if you are in Corner Mode). The files are ASCII files containing the coordinates of the tracked points, and their Size and Move values. A point file is recalled into the Curve Popup for the motion path of an animation actor. A corner file is recalled into the Keyframe Timeline of an animation actor.

Luminance, H, S, V, R, G, and B Buttons

The Motion Tracking function uses one of these components to track an area on the Canvas. Luminance is the most common. Choose the mode to use that will best isolate the element you want to track. For example, if tracking a yellow sign, highlight the R & G buttons.

OK and Cancel Buttons

Press OK to start processing the Motion Tracking function. All the points are calculated and saved into the currently designated Output File. The Cancel Button brings down the popup without starting the tracking, while maintaining the current values.

If the software is unable to track a point in a given frame, an error message will appear in the prompt window and tracking will halt. If this occurs, try

increasing the "size" or "move" dimensions, or try using a different color component (H, S, V, R, G, B, etc.)

As tracking proceeds, a red wireframe bounding box is drawn on the canvas when each point is found in the current frame. This gives the user a visual cue that the tracking is proceeding correctly.

Separating Points from Image with Warp Corners

To separate the corner points from the tracked image, use Warp Corners Mode in the Paste/Distort Popup in the Paint Environment. For example, if you've read a Motion Tracking corners list into an actor (using the Corner List Button), the corners list might define a window on the side of a house. You might want to move the corners list away from the window to define a sign somewhere else on the wall.

You access this feature through the Paste Distort Popup, in Warp Corners mode (see page #). Press on the window labeled "Image" at the top of the Popup. This toggles the window to "Texture" mode and displays a green wireframe representing the image. You can then detach the green wireframe, along with the image, from the (red) corner points by moving its center point. You can also adjust its corners to rescale the image relative to the original (red) corner points. During these operations, the image stays in the same perspective as the corner points.

The Texture Button

The Paste/Distort Popup in Edit Keyframe Mode has a Texture Button just below the "prev" Button. The Texture Button is highlighted when the image for Warp Corners has been detached from the corner points for the current keyframe. The Texture Button is off when the image has not been detached from

the corner points for the current keyframe (or the image may have been detached before or after the current keyframe, in which case the offset values will be interpolated).

Motion Tracking Procedure - Point Mode

The procedure for Motion Tracking (Point Mode) consists of two procedures: building the point list in the Paint Environment, and compositing the tracked element(s) over a background in the Animation Environment.

Build Point List (Paint Environment)

- 1. **Press the Motion Tracking Button on the Image Tools 2 panel to activate the Motion Tracking Popup.**
- 2. **Click in the File window and select first filmstrip file to be used to select reference point.** The selected image is recalled to the Canvas.
- 3. **In the Start window, enter number of base or beginning cel of filmstrip sequence.**
- 4. **Click in the End window; enter number of last cel of filmstrip sequence plus 1.**
- 5. **Click in the Output window to select a directory, and type a filename that will be the recorded point list.**
- 6. **Click on the Point/Corner button and make sure it is set to Point.**
- 7. **Click on the desired component buttons (luminance, R, G, B, H, S, V) to narrow or isolate the tracking of the selected pixel(s).**
- 8. **Press the Point 1 Button and move the cursor over the canvas.** (If desired, zoom into

the selected area of the canvas for easier pixel selection.)

- 9. **Press down on the point/area you want to track.** The X and Y windows display the X and Y coordinates of the point you picked.

- 10. **Press the Size button.** Enter the size (in pixels) of the area you want to track.

- 11. **Press the Move button.** Enter the maximum movement per frame you expect the area to move (in pixels).

- 12. **Press the OK button.** The system will automatically recall each cel in the sequence, analyze the position of the selected area, draw a bounding box on the canvas of the new position and then recall the next cel.

NOTE

It is recommend that you watch the processing of the tracking data to ensure that the reference wireframe is corresponding to the selected area. If not, press the END key on the keyboard, increase the values in the SIZE and/or MOVE windows, and press the OK button again.

Compositing Tracked Element (Animation Environment)

- 1. **Go to the Animation Environment.**

- 2. **Press the red corner box of the Delete Button to delete all layers currently in the animation timeline.**

- 3. **Press in the Actor Type popup of the Add Actor button.**

- 4. **Select the Filmstrip actor type.**

- 5. **Press the Add Actor button and click twice quickly on Layer 1 of the timeline to add the Filmstrip actor to the timeline.**
- 6. **Click on the File window and select the same file sequence (filmstrip) as selected in step 2 above.**
- 7. **Click on the In window and select the starting cel.** This should match the same number as in Step 3 above.
- 8. **Click on the Out window**. This number should match the number entered in Step 4 above.
- 9. **Add a second actor to the timeline on Layer 2.** This can be a cel or filmstrip actor type.
- 10. **Click on the File window and select the filename of the image(s) to be tracked and composited over the base actor.**
- 11. **Click on the Edit Path button to bring up the Curve Popup.**
- 12. **Click on the Point List button and select the Point List filename as saved in Step 5 above.**
- 13. **You can now preview the tracked animation or render it to a storyboard, disk, VTR, or DDR.**

Motion Tracking Procedure (Corners Mode)

The procedure for Motion Tracking (Corner Mode) consists of two main procedures: building the corner list (very similar to building a point list) and compositing the tracked element(s).

Build Corner List (Paint Environment)

- 1. **Press the Motion Tracking Button on the Image Tools 2 panel to activate the Motion Tracking Popup.**
- 2. **Click in the File window and select first filmstrip file to be used to select reference point.** The selected image is recalled to the Canvas.
- 3. **In the Start window, enter number of base or beginning cel of filmstrip sequence.**
- 4. **Click in the End window; enter number of last cel of filmstrip sequence plus 1.**
- 5. **Click in the Output window to select a directory, and type a filename that will be the recorded corner list.**
- 6. **Click on the Point/Corner button and make sure it is set to Corner.**
- 7. **Click on the desired component buttons (luminance, R, G, B, H, S, V) to narrow or isolate the tracking of the selected pixel(s).**
- 8. **Press the Point 1 Button and move the cursor over the canvas.** (If desired, zoom into the selected area of the canvas for easier pixel selection.) Start by selecting the lower left point of the warped rectangle that will be defined by the four points.
- 9. **Press down on the point/area you want to track.** The X and Y windows display the X and Y coordinates of the point you picked.
- 10. **Press on the Point 2 Button and select the second corner point.** Move in a counter-clockwise direction from Point 1.
- 11. **Repeat Step 10 for Points 3 and 4, continuing in a counter-clockwise direction.**

- 12. **Press the Size button.** Enter the size (in pixels) of the area you want to track.

- 13. **Press the Move button.** Enter the maximum movement per frame you expect the area to move (in pixels).

- 14. **Press the OK button.** The system will automatically recall each cel in the sequence, analyze the position of the selected area, draw a bounding box on the canvas of the new position and then recall the next cel.

NOTE

It is recommend that you watch the processing of the tracking data to ensure that the reference wireframe is corresponding to the selected area. If not, press the END key on the keyboard, increase the values in the SIZE and/or MOVE windows, and press the OK button again.

Compositing Tracked Element (Animation Environment)

- 1. **Go to the Animation Environment.**

- 2. **Press the red corner box of the Delete Button to delete all layers currently in the animation timeline.**

- 3. **Press in the Actor Type popup of the Add Actor button.**

- 4. **Select the Filmstrip actor type.**

- 5. **Press the Add Actor button and click twice quickly on Layer 1 of the timeline to add the Filmstrip actor to the timeline.**
- 6. **Click on the File window and select the same file sequence (filmstrip) as selected in step 2 above.**
- 7. **Click on the In window and select the starting cel.** This should match the same number as in Step 3 above.
- 8. **Click on the Out window**. This number should match the number entered in Step 4 above.
- 9. **Add a second actor to the timeline on Layer 2.** This can be a cel or filmstrip actor type.
- 10. **Click on the File window and select the filename of the image(s) to be tracked and composited over the base actor.**
- 11. **Click on the Edit Path button to call up the Curve Popup.** The Curve Popup appears.
- 12. Click on the Corner List button to bring up a file popup
- 13. Click on the desired Corners List file (saved in Step 5 above.)
- 14. **Click in the Ref window and enter the file number of the first image tracked, as entered in Step 3 above.**
- 15. **Press the Enabled button to highlight it, thereby activating the Corners mode.**
- 16. **Press the OK button to close the Corners popup.**
- 17. **Press the OK button to close the Keyframe Timeline popup.**

- 18. **You can now preview the tracked animation or render it to a storyboard, disk, VTR, or DDR.**

5.9.2 Motion Stabilization

Motion Stabilization is a tool to stabilize a digitized sequence of images that have undesired movement such as film weave. The procedure involves defining the reference area in a selected frame (the "Reference Frame") of the sequence, saving the reference area as a mask which is then called up by the multiple cel actor. The following steps illustrate the Motion Stabilization procedure. *Refer to* ***"Motion Stabilization" on page 5-118*** *for more information.*

Motion Stabilization Procedure

- 1. **Go to the Paint Environment and recall the "Reference Frame" from the sequence to the Canvas.**

- 2. **Within the reference frame, choose a rectangle of pixels which you want to remain stable throughout the sequence of frames.** Select the pixels using the Rectangle Mask function in the Mask Tools 1 panel, and save the result to a Mask file.

NOTE

A larger rectangle will achieve better results, but will also take more processing time per frame. This is because more pixels are being corrected.

- 3. **Go to the Animation Environment and start with an empty animation timeline.**

- 4. **Create a Cel actor for the sequence you want to stabilize.** As with any Cel actor, enter

the first filename of the image sequence into the File window of the Actor Edit popup. Then, press on the "Single" button to bring up the Cycle/Filmstrip Popup. In this popup, enter the number of the first file in the sequence into the "In" window. Enter one beyond the number of the last file in the sequence into the "Out" window. Once this is complete, the "Single" window's label will change to "Multiple". Press on this window to exit the Cycle/ Filmstrip Popup.

- 5. **Press on the Stabilize button to enable (highlight) Stabilization in the Actor Edit Popup.** Once activated, the Ref, X, Y, and Mask buttons will also become activated.

- 6. **Set the Ref window to the file number of the reference frame.**

- 7. **Click in the X window and enter a number.** This is the distance that will be searched horizontally for each frame. Higher values will correctly handle sequences with greater movement, but will also take more processing time. A value between 10 and 30 will work for most sequences (10 is the default value.)

- 8. **Click in the Y window and enter a number.** This is the same as the X window in Step 7 except for the vertical direction.

- 9. **Click in the Mask window and select the filename saved in Step 2.**

- 10. **You can now preview the animation or render it to a storyboard, disk, VTR, or DDR.** If the Stabilize button is on, the frames in the Cel Actor will be stabilized as they are rendered.

NOTE

If the Cel Actor fails to render, it is often due to loss of correlation between image frames. If this occurs, try increasing the X and Y distance values in the Actor Edit popup (steps 7 and 8). If this fails, try increasing the size of the reference frame's correlation mask (step 2).

If the Cel Actor's files fail to recall, check the frame number of the reference frame (step 6). Also, check the In and Out frame numbers in the Cycle/Filmstrip Popup of the Cel Actor (Step 4).

5.10 Animation Playback Functions

Use the playback functions to play animations in one of three basic modes: Preview, Storyboard, and Record. These are playback mode buttons, only one of which can be on at a time. Preview Mode renders to the screen in various ways, without saving or recording anything.

Storyboard Mode records the animation (with a choice of various resolutions) to a disk file, so that it can be played back as a preview. You can also drag the Preview Handle at the top of the Timeline to manually play back the different Preview modes.

Use Record Mode for final rendering to a recording device or to disk; it is always at full resolution. After choosing a playback mode by pressing it, you must press the Run Button to begin the play back.

Animation Preview Button

Figure 5-55. Playback Buttons

Press the main part of the button to turn on Preview Mode. Press the corner button to display the Preview Animation Popup.

Animation Preview Popup

Figure 5-56. Preview Animation Popup

The Animation Preview Popup contains three mode buttons: Wireframe, Outline, and Render. Press the OK Button to confirm your choice of mode and make the popup disappear. The three Preview modes do not save or record anything, but display on the screen only.

Wireframe Preview

When this mode is active, the animation plays representing each actor by a separate rectangular bounding wireframe. This is the fastest playback mode, since it uses only wireframes with no rendering. It is useful for getting a quick, general sense of the motion in an animation. Press the Run Button to start playback.

You can press and drag the Preview Handle (the cursor at the top of the timeline) to dynamically view the motion. The Preview Handle is red when the Render Preview Mode is chosen; otherwise it's white.

Outline Preview

When this mode is active, the animation plays representing each actor by an outline based on its alpha (transparency). For example, a Cel Actor containing a logo saved on a transparent background displays the logo's outline shape. Press the Run Button to start playback. As another example, Text Actors display as outlines in this mode.

To display its outline, a file must have been saved to disk in Liberty 5.5 or later. If the file was saved in an earlier version of Liberty it will display as a rectangle wireframe. To display it as an outline, simply recall it and re-save it in the Paint Environment.

Render Preview

When this mode is active, the animation renders the current frame to the screen in full resolution. The current frame is determined by dragging the Preview Handle (the red cursor at the top of the Timeline) along the top of the Timeline to its desired position and releasing.

To render a frame with Render Preview Mode:

- 1. **Press the corner button of the Animation Preview Button.** The Preview Animation Popup appears.
- 2. Press the Render Mode button to activate it, if it's not already high-lighted.
- 3. Press OK to remove the popup.
- 4. Press and drag the red Preview Handle cursor along the top of the Timeline until it is at the frame you want to render.
- 5. Lift up on the pen or mouse. The current frame renders to the screen.
- 6. Repeat as desired.

Render Preview mode does not use the Run Button for playback. If you press the Run Button while Render mode is active, the animation plays back in Wireframe.

Animation Preview Handle

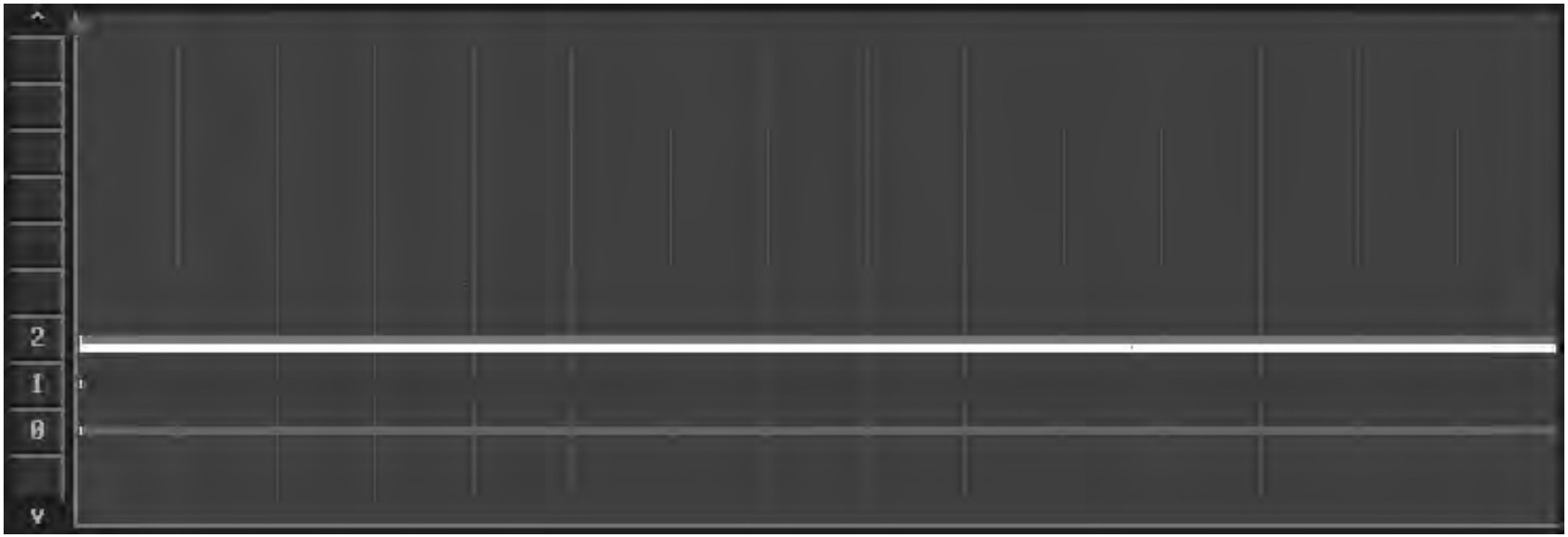

Figure 5-57. Animation Timeline

The Preview Handle is a cursor at the top of the Timeline. Its default position is at the left end of the Timeline. Press and drag it along the top of the Timeline to manually display the animation in the current Preview Mode. In Wireframe and Outline Modes as you drag the Handle, the animation plays back according to the position of the moving Handle. In Render Mode, one frame is rendered at the point where you lift the pen or mouse.

The handle changes color to red in Render Mode to alert you that it will render-over the canvas if dragged on the timeline.

When selected, an actor with multiple files (Filmstrip, Cycle, or Multiple Cel Actors) in the animation displays its current filename and thumbnail as you drag the Handle along the Timeline. Thus, you can watch the multiple files animate in the Browse image in the Actor Popup. The filename shown in the File Button Text Window changes as well.

When dragging the Handle in Preview Mode, you can drop down inside the Timeline where the wireframe of the actor that the pen is over on the Timeline highlights.

The Prompt Window at the bottom of the screen displays the frame number of the cursor's position as it moves across the Timeline.

The Handle works in the Keyframe Timeline Popup as well.

In Storyboard Preview, the Preview Handle manually plays back the current Storyboard file (see below). When thus using the Preview handle in Storyboard Mode, be sure that the animation on the Timeline matches the animation in the current Sto-

ryboard elevator. In Storyboard Mode the animation in the current Storyboard Elevator plays, not the animation currently on the timeline.

Animation Storyboard Button

Figure 5-58. Record Popup

The Animation Storyboard functions allow you to record and play back rendered previews of the current animation, using the SGI Movie (extension

.mv) and the Quicktime Movie (extension .mov) formats. Four different resolution settings are available for the Storyboard preview, as well as variable playback speed. The SGI Movie files are readable by SGI media collaborations such as Moviemaker, Movieplayer, and ShowCase.

To render a Storyboard preview of an animation:

- Create an animation in the Timeline or recall one from the disk.
- Set the duration of the animation. Often it's good to use a short duration for a Storyboard, unless you need to see a very detailed Storyboard. For one thing, a long Storyboard can use up a lot of disk space. However, extremely short durations (say, 5 to 10 frames) can leave out large parts of the animation.
- Press the Storyboard Button to activate Storyboard mode.
- Press the "R" corner button of the Storyboard Button. The Record Control Popup appears.
- **Press the Fine Button to set the resolution.** Fine is normally the preferred resolution. If you are prompted whether to change the resolution, answer Yes.
- **Press the Path Window to set a path and filename for the Storyboard to be recorded under.** The current elevator level is used.
- **Press the Overwrite Button if it's not already high-lighted**. This is the default mode for recording a new Storyboard, or over-writing an existing one.

- **Press the OK Button to remove the Record Popup.** The popup disappears.

- **Press the Run Button.** (The Story Button must be high-lighted). The animation renders. You can press the End key on the keyboard to abort Storyboard render.

To play back a Storyboard preview of an animation:

- **Press the "P" corner button of the Storyboard Button to bring up the Storyboard Popup.** The popup appears.

- **Press the Play 1 Button.** The Storyboard cues to the beginning and plays back once.

5.10.1 Record Control Popup

Press the "R" corner button of the Storyboard Button to call up the Storyboard Popup.

Record Modes

Press one of the three Record Mode Buttons to choose one. They are Overwrite Mode, Insert Before Mode, and Append Mode.

Overwrite Mode

Activate Overwrite to record a new Storyboard, or to overwrite all or part of an existing Storyboard.

The Start and End Windows

The Start and End Windows display the beginning and ending frames of the file to be overwritten. If you are recording a new Storyboard file, the Start and End Windows are by default set at 0. You can press in the Start/End Windows to type in new val-

ues, or change them by using the Frame Slider. Pressing the main part of the Start or End Windows displays the specified frame on the canvas, so you can see which frames will be overwritten.

The Frame Slider

The Frame Slider displays Start and End indicators. Press and drag the left indicator to change the Start Window value. Press and drag the right indicator to change the End Window value. Frames of the current Storyboard file are displayed on the Canvas as you drag the indicators. You can also display the start or end frame on the Canvas by pressing directly on the word “Start” or “End.” You can also change the Start/End values by pressing the Decrement (<) or Increment (>) Frame Buttons at either end of the Frame Slider.

Insert Before Mode

To insert frames into an existing Storyboard file, activate the Insert Before Button. Set the Start Window to the frame before which you want to insert the new frame(s). The insert frame is displayed on the Canvas.

Append Mode

To append frames to the end of an existing Storyboard file, activate the Append Button. The last frame is displayed on the Canvas.

Erase Functions

The Erase Functions allow you to selectively delete frames from a Storyboard file.

Erase Block

Press to delete the frames between the frames displayed in the Start and End Windows, inclusive.

Erase One

Press to erase the Start frame.

Erase All

Press to erase all the frames in the Storyboard file.

Record Rate Window

Press this window to change the default rate at which the Storyboard will be played back during normal play. When you play back the Storyboard, the Playback Popup allows you to select a different playback rate than the one recorded in the file.

Storyboard Resolution Modes

Press one of the Storyboard Resolution Modes to activate it. Choices are Full, Fine, Normal, or Coarse.

Full Resolution

The resolution of the frame recorded to the Storyboard is the same as the Canvas resolution.

Fine Resolution

The resolution of the frame recorded to the Storyboard is one-half the Canvas resolution.

Normal Resolution

The resolution of the frame recorded to the Storyboard is one-third the Canvas resolution.

Coarse Resolution

The resolution of the frame recorded to the Storyboard is one-fourth the Canvas resolution.

X Resolution Window

Press in this window to type in a new resolution for the width of the recorded image. The y resolution is automatically computed to preserve the current aspect ratio.

Y Resolution Window

Press in this window to type in a new resolution for the height of the recorded image. The aspect ratio is NOT automatically preserved. Thus, if you want to change the aspect ratio, change x first, then y.

Filter Button

Press the Filter Button to turn it on, thereby enabling interpolation on the rendered Storyboard frames. When Filter is off, the frames are not interpolated. Interpolation filters the frames, giving them a softer look. It makes rendering take a little longer. Does not apply to Full Resolution images.

When you try to change the Resolution Mode (or the X/Y settings) while the current Storyboard elevator level has a Storyboard in it, you will be prompted:

Resolution changed. Erase Storyboard?

Press Yes to erase the current Storyboard and change the resolution.

Generally, the Fine Resolution Mode is preferred, since it gives a fairly high quality renderings, without taking as much time as Full Mode. However (since Storyboard renders to disk) the finer the reso-

lution, the more disk space is required for storage. Since there is no limit to how long a Storyboard can be, it is possible to use quite a bit of disk space for Storyboards. The coarser resolutions use less disk space. Coarse render takes 12 KB per frame; Normal takes 48 KB per frame; Fine takes 192 KB per frame; and Full takes 1555 KB per frame. Use Full mode only when necessary.

Storyboard renders to the Canvas in full resolution, then converts the frame to the currently selected resolution and stores the frame to disk. However, you may notice that as it renders to Canvas some elements look a little compressed. This is because actors that are rotated or scaled are rendered to the Canvas at lower resolution to save time during Storyboard rendering. To see a full-resolution frame, use Full Mode.

Storyboard Elevator and Path Window

Press on one of the six Storyboard elevator levels to choose it for rendering a Storyboard. The Storyboard renders to the disk path in the current elevator level. If the current elevator level contains a Storyboard when you press Run, you are prompted as to whether you want to overwrite it. To change the path in the current Storyboard elevator level, press in the Path Window and select a disk/directory/filename for the Storyboard file.

File Data Button

Press the File Data Button to call up the Storyboard File Control Popup. Here you can enter title information and comments that will be saved with the Storyboard when you perform a Record. You can

also choose recording formats and compression schemes. For details about these functions, see page 5-246.

Browse Button

Pressing the Browse Button will create a browse image of the storyboard using the current frame, similar to normal Liberty browse images.

5.10.2 Playback Control Popup

Figure 5-59. Playback Popup

The Playback Control Popup allows you to play back Storyboard files at various speeds, loop modes, rates, and resolutions

Press the "R" corner button of the Storyboard Button to call up the Storyboard Popup.

Play Once Button (Play 1)

Press the Play Once Button to play the current Storyboard from its beginning to its end, then stop.

Play Button

Press the Play Button to play the current Storyboard forward from the current frame.

Fast Forward Button (FF)

Press the FF Button to play the current Storyboard at double-speed forward from the current frame.

Reverse Button (Rev)

Press the Reverse Button to play the current Storyboard backward from the current frame.

Fast Reverse Button (FR)

Press the FR Button to play the current Storyboard at double-speed backward from the current frame.

Stop Button

Press to stop playback.

Frame Window

The Frame Window displays the current frame of the Storyboard on the Canvas. You can press on the Frame Window itself and type in a frame number to go to that frame.

Start and End Windows

The Start and End Windows display the start and end frames of the current Storyboard file. Press in either one to change the start/end time of the play back. For example, if you have a 30-frame Storyboard file, you can set the Start Window to 10 and the End Window to 20. Pressing Play plays frames 10 through 20.

Pressing above the Start or End Windows (right on the word) displays the start or end frame on the Canvas.

Playback Frame Slider

This slider allows you to manually control playback of a Storyboard by pressing and dragging the slider. The buttons on either end of the slider allow you to move one frame at a time through the Storyboard, backwards (<) or forward (>). Press and drag the small markers above the slider to manually change the Start and End frames of the Storyboard playback.

Playback Modes

The Playback Once Button

When activated, the Storyboard plays once, then stops.

Loop Playback Button

When activated, the Storyboard plays repeatedly, until you press the Stop Button. Plays the number of times set in the Num Loops Button. Loop Direction depends on which play buttons you press to start playback (forward or reverse).

Swing Playback Button

When activated, the Storyboard plays repeatedly forward to the end and then in reverse back to the beginning, repeating until the you press Stop. Plays the number of times set in the Num Loops Button.

Num Loops Button

Press to set the number of loops to play the Storyboard when you are in Loop or Swing Mode. If set to 0 (zero), the Storyboard loops indefinitely until you press the Stop Button.

Loops Counter Button (Loop Ctr)

Show how many loops have been played (no display if Num Loops is infinite).

Speed Slider

Use this slider to manually vary playback speed while the Storyboard is playing. Set the playback mode to Loop or Swing, then press and drag the slider between the left end (-2, reverse) and the right end (+2, forward). A speed of 1 plays at the requested rate, where a speed of 2 plays back at twice the requested rate. A negative speed plays back in reverse.

Rate Selection Modes

Requested Rate Window

This window shows the rate that the Playback Control is attempting to achieve, depending on hardware platform, size of frames, etc. Press in the window to type a number, or use one of the six Rate Buttons just below (Normal, 1 FPS, etc.).

If playback fails to achieve the requested rate, a message appears in red in the Prompt window at the bottom of the screen.

Actual Rate Window

This window shows the rate of the actual playback. When the Actual Button is high-lighted the rate is displayed for each frame. When it is not high-lighted, an average rate is displayed, averaged over the last full second of playback.

Normal Button

Press to high-light and set the requested rate at the default rate recorded when the Storyboard file was created.

1 Frame Per Second Button

Press to high-light and set the requested rate at one frame per second.

Play Every Frame Button

Press to high-light and play back every frame of the Storyboard, regardless of the requested or recorded rate. Every frame is displayed.

Quarter Button

Press to high-light and set the requested rate at one quarter of the recorded (Normal) rate.

Half Button

Press to high-light and set the requested rate at one half of the recorded (Normal) rate.

Double Button

Press to high-light and set the requested rate at twice the recorded (Normal) rate.

Resolution Windows

These buttons are for information only.

The Storyboard can be played back only in multiples of its recorded resolution. The “Recorded” Windows show the X and Y dimensions of the recorded Storyboard file. The “Actual” Windows show the X and Y dimensions of the images on the Canvas.

Magnifying Storyboards

You can use the “In” and “Out” Magnify Buttons to decrease or increase the resolution of the Storyboard frames on the Canvas, but there are some limitations. You can magnify the Storyboard to a resolution larger than the current Canvas resolution. (However, a Storyboard recorded at a higher resolution than the current Canvas will be displayed as well as possible.) You cannot zoom out farther than the resolution of the recorded Storyboard (so a Storyboard recorded at Full resolution cannot be zoomed out).

Displaying Full-Screen Storyboards

Press the On Button below the Animation Timeline to enable the Permanent Storyboard display. Then press the Canvas Button to display the Storyboard full-screen on the Canvas. The Permanent Story-

board Buttons are available at the bottom of the screen for various playback options. See page 5-251 for a full description of these functions.

Storyboard Elevator and Path Window

Press on one of the six Storyboard elevator levels to choose it for playing a Storyboard. To change the path in the current Storyboard elevator level, press in the Path Window and select the disk/directory/ filename of a Storyboard file to play back.

File Data Button

Press the File Data Button to call up the Storyboard File Control Popup. Here you can enter title information and comments that will be saved with the Storyboard when you perform a Record. You can also choose recording formats and compression schemes.

Browse Button

Pressing the Browse Button will create a browse image of the storyboard using the current frame, similar to normal Liberty browse images.

File Control Popup

Figure 5-60. File Control Popup

Title Window

Press and type in text to title the Storyboard.

Comment Window

Press and type in comments about the Storyboard.

Format Window

Press to toggle between SGI 3 and Apple Quicktime formats.

Packing Window

Automatically set based on format choice.

Compression Window

Press to cycle through 5 compression choices for the SGI 3 format. For Apple Quicktime, choose between Uncompressed or JPEG. See table below for a comparison of compression types.

Interlacing Window

Currently, always non-interlaced.

Orientation Window

Currently, always Bottom-to-Top.

Compression Schemes

These are some notes on the 5 compression schemes supported by Liberty for SGI 3 movies. They include comparisons between file size and playback rate of movies recorded with each scheme, at various resolutions.

The basic compression schemes are summarized here (in order of highest to lowest disk storage required):

Uncompressed: Achieves 30 FPS at lower image resolutions, but requires the most disk space.

MVC1: SGI proprietary algorithm designed for rapid decompression of motion video. Pretty good playback rate obtained with some loss of image quality.

RLE: A "lossless" compression algorithm for storing images, but introduces patterns in solid colors when played back from the movie library. Not the best choice when high playback rates are desired.

MVC2: An improved version of MVC1, since data compression and playback rates are higher. JPEG: Best compression in terms of saving disk space, but image degradation is ugly and achieving a reasonable playback rate is impossible.

The following comparisons were done by rendering and playing back the same animation in all of the configurations listed below. The animation consists of 13 frames of numbers from 0 to 12. The frames have a high number of repeating pixels.

Image resolution: 720 x 540 (FULL)		
Format	Size (K)	Playback Rate (FPS)
Uncompressed	20218192	13.5
MVC1	1997648	11.8
RLE	904530	6.9
MVC2	508867	10.6
JPEG	247936	1.5

Image resolution: 360 x 270 (FINE (1/2) resolution)			
format	size (k)	playback rate (FPS)	
		at Full Res:	at Native Res:
Uncompressed	5054992	11.0	39.0
MVC1	528884	11.0	35.0
RLE	233420	10.0	24.0
MVC2	151027	11.0	38.0
JPEG	95484	4.0	5.0

Image resolution: 240 x 180 (NORMAL (1/3) resolution)			
format	size (k)	playback rate (FPS)	
		at Full Res:	at Native Res:
Uncompressed	2246992	24.0	60.0
MVC1	239908	23.0	58.0
RLE	107075	20.0	43.0
MVC2	68681	24.0	63.0
JPEG	58680	9.0	12.0

Image resolution 180 x 135 (COARSE (1/4) resolution)			
format	size (k)	playback rate (FPS)	
		at Full Res:	at Native Res:
Uncompressed	1264192	31.0	84.0
MVC1	138904	37.0	78.0
RLE	60949	33.0	61.0
MVC2	45823	38.0	82.0
JPEG	42688	15.0	19.0

Permanent Storyboard Buttons

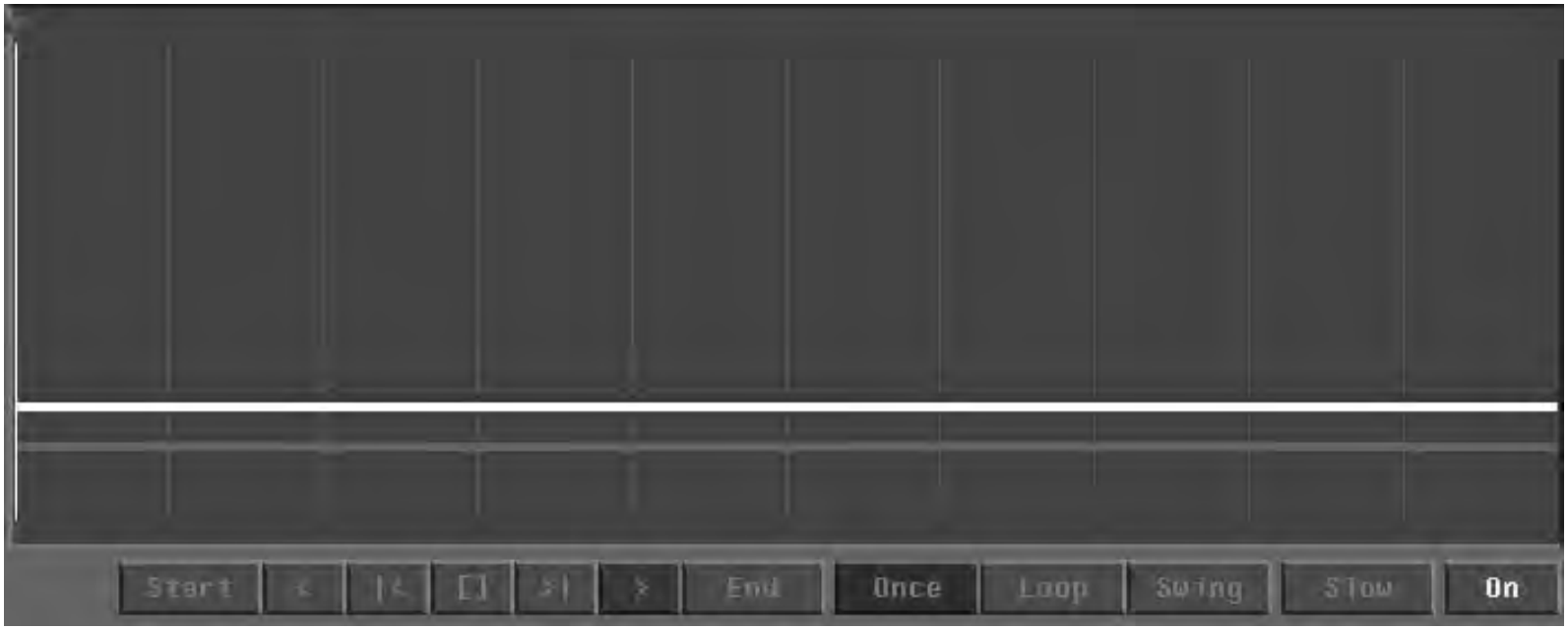

Figure 5-61. Permanent Storyboard Buttons

At the bottom of the Timeline is a permanent row of buttons that duplicate the Storyboard Playback Buttons. Use them to run storyboards at any time, for example, while editing keyframes in the Keyframe Timeline. (Otherwise, too many popups up at one time can cause problems.) These buttons are identical to the Storyboard Playback Buttons described above. Press the On Button to enable/disable the Permanent Storyboard Buttons.

Magnifying the Storyboard Playback

Liberty allows zoom-in, zoom-out, autopan, and full-screen (the Canvas Button) display for the Storyboard. These functions work with either the Storyboard Popup or the Permanent Storyboard Functions.

When the Permanent Storyboard is on, you can run a Storyboard by pressing and dragging on the preview strip above the timeline, just like wireframe preview. Note that this function will work with any Storyboard, not necessarily the one that corresponds with the animation currently on the Timeline.

Recording Over Part of an Existing Storyboard

When you have recorded a Storyboard and play it back and find you want to change only a part of it, you can use the following procedure:

To record over part of an already recorded Storyboard:

- Make the changes in the animation in the Timeline.

- Set the Skipin and Skipout windows so that the part of the animation you want to tape over with is the only part that records. It will record over the corresponding frames of the Storyboard.

- **Press on the Storyboard Button.** The Storyboard Popup appears.

- Press on the elevator level of the Storyboard you want to record over part of.

- Make sure Append is not on, and press OK.

- Press Run. The Storyboard Confirmation Popup appears. Your choices are Yes, No, and Cancel.

- **Press No.** The Storyboard is recorded over. When using this procedure, make sure that the duration of the Storyboard and the duration of the animation match, or you will tape over the wrong parts.

When you play back the Storyboard by pressing the Once, Loop, or Swing Buttons, only the newly recorded frames play back. To play back the entire Storyboard, reset Skipin and Skipout to zero. In other words, the settings of Skipin and Skipout control which frames of the Storyboard play back. You can play back the entire animation without setting Skipin/Skipout to zero by resetting Storyboard playback to the beginning (the Begin Button) and pressing the Forward Play Button and holding it down.

Record Animation Button (Final Render Mode)

Figure 5-62. Playback Buttons

Press to turn on. Pressing the Run Button with this mode on renders the animation at full resolution out to the current target video recording device (or hard disk).

Background Render

You can record to a recording device "in the background" while at the same time running a second version of Liberty.

To render an animation in the background:

- 1. **Save a version of the animation that is ready to render.** You must save the animation with the correct in-time. Holdin, Skipin, Dur, etc. are also saved in the animation file.
- 2. **Set all record parameters.** This includes everything on the Target Setup Menu - the appropriate device, etc. It's important to set each VTR's destination correctly, or if only using one VTR, to make it the current VTR. Everything in the Run Popup (fields vs. frames, etc.) is also saved in the database file when you exit Liberty.
- 3. Exit Liberty.
- 4. **In a shell, type: liberty32 -b path/filename &** **(**For example, liberty32 -b /usr/people/liberty/

image/local/hd0/anim1.an &) The animation begins to render.

- 5. **Start another version of Liberty**. You can start Liberty from the desktop or from another shell. When using Liberty avoid initializing the record device. Any changes you make in the record parameters will not affect the animation that is currently being background rendered.

Note: If you want to stop the background render before it's finished, exit liberty and in one of the shells type:

killall liberty32

Run Animation Button

Press to run the animation. The mode of playback depends on which mode button is turned on, Preview, Storyboard, or Record.

Run Popup

Figure 5-63. Run Popup

Pressing the corner button of the Run Button calls up the Run Popup.

Frame/Field Modes

Here you can choose Frame Mode to record by frames or choose Field Mode to record by fields (if the designated recording device supports field recording). Use Field Mode for the smoothest motion in an animation, though it takes twice as long as frame mode. Horizontal, vertical or diagonal motion can be flickery when rendered in Frame Mode. You can record to hard disk either in frames or fields. Storyboard renderings always are in frames, ignoring the field mode if it's on. You also have the option of recording the even or odd field first. Only change this if an animation rendered by fields is showing undue flicker.

Matte Modes

Also on the Run Popup, two record modes allow you to record high-contrast mattes of your animation, for creating a matte reel. The Matte Only Mode records animating elements white on black (black appears where there is transparent background). Invert Matte records animating elements black on white.

Ring Bell

When Ring Bell Mode is on, Liberty will emit a bell-like tone when an animation finishes rendering.

Create Log

When Create Log Mode is on, the progress of the animation is printed frame-by-frame in the shell outside of Liberty.

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